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ON THE INTERPRETATION OF EMPEDOCLES

A DISSERTATION

SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL OF ARTS
AND LITERATURE IN CANDIDACY FOR THE DEGREE
OF DOCTOR OF PHILOSOPHY

(DEPARTMENT OF GREEK)

BY
CLARA ELIZABETH MILLERD

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PREFATORY NOTE

In its original form this study included a series of notes on the fragments of Empedocles, discussing the meaning of doubtful passages, and examining in detail the important interpretations hitherto proposed. In order to reduce the whole to reasonable compass these notes have been omitted, though the wide range of divergent interpretations was interesting and highly instructive.

To the courtesy of Mr. Fred C. Conybeare I owe the valuable hints recorded on p. 62, toward the interpretation of a vexed passage of Philo.

To Professor Paul Shorey I wish gratefully to acknowledge my indebtedness both for the subject of this study and for many helpful criticisms and suggestions.

To the following well-known works reference will be made simply by the name of the author. If other works by the same writer are cited, the titles will be given.

REFERENCES

BEARE: *Greek Theories of Elementary Cognition.*

BURNET: *Early Greek Philosophy.*

DIELS: *Vorsokratiker.* (Diels's numbering of the fragments of the pre-Socratics is followed, where not otherwise specified.)

GOMPERZ: *Griechische Denker.*

KARSTEN: *Empedoclis Agrigentini Carm. Reliquiae.*

MULLACH: *Philosophorum Graecorum Fragmenta.*

ROHDE: *Psyche.*

STEIN: *Empedoclis Agrigentini Fragmenta.*

TANNERY: *Pour l'histoire de la science hellène.*

WINDELBAND: *Geschichte der alten Philosophie.*

ZELLER: *Geschichte der griechischen Philosophie.* (Vol. I, when not otherwise specified.)

The references to the Aristotelian commentators cite the pages of the Berlin edition, unless otherwise specified.

INTRODUCTION

In all departments of historical and philological criticism of the present day, the influence of the evolutionary point of view is apparent in the intense interest shown in the beginnings of human effort. Attention is now focused, not upon the great periods of fulfilment, but upon the times of groping and of early promise. In Greek philosophy this tendency has centered attention upon the pre-Socratics, in whom the fundamental conceptions of thought are seen in the process of making. But man has cared as little as does Nature to preserve his first bungling attempts to bring order out of chaos, and only fragments and scattered notices of this group of thinkers remain to us. Marvelous constructive work has been done in the attempt to restore what was lost. The language of the fragments that have come down to us has been criticized, corrected, and emended, until Diels's *Vorsokratiker* presents us with a remarkably satisfactory text. The secondary authorities have been searched for references and allusions, until the student has ready access to almost all the information we possess upon early philosophy. Criticism has undertaken further the task of piecing together this material, the task not only of making a single whole out of all that we know of each system, but of relating these systems to one another, and of attempting to gain a unified view of the entire epoch. It would be difficult to overrate the value of the work that has been done, yet surprising disagreement prevails among the best critics and historians of philosophy, even upon very fundamental points. The purpose of the present study is to get at the sources of this disagreement in the interpretation of one of this group of thinkers, Empedocles, and to bring into juxtaposition the various possibilities in the solution of the important problems, and thus to contribute to a more stable reconstruction of his thought. Writers upon Empedocles, and upon pre-Socratic thought in general, have worked too much in isolation; have taken too little account of each other's results. A fuller knowledge of the work of other critics would furnish a most wholesome corrective of the tendency toward venturesome conjecture. As soon as an adequate notion is gained of the range of divergent interpretations, assurance is greatly lessened in new hypotheses supported by nothing save the absence of conflicting testimony. There is value in the attempt to face the precise results given by a fair examination of the evidence, without effacing contradictions or filling in gaps in our data by unsupported assumptions. Aristotle found Empedocles' thought at times unsatisfying because

of its omissions, its inconsistencies, and perhaps also its superficiality. We should expect philosophy at this stage in human development to present these characteristics. We should expect to find concepts ambiguous, ill-defined, often shifting in their meaning. Most of the criticism not only of Empedocles, but of all the thinkers of this period, has assumed in them far too great a degree of consistency and clearness of definition. It is true that the Greeks were a people with a genius for clear-cut distinctions and for precision of thought. Otherwise they would never have created a philosophy at all, much less a philosophy which included and defined the main concepts of all subsequent European thinking until the present time. But this power of clear definition was not present from the first; the same tentative blundering is to be found in this realm as in sculpture, where an equal precision and clearness of definition were ultimately attained. It is impossible to deny the helplessness of the early attempts in plastic art, though we may seek to find in them the germ of later achievement. Early philosophy in its fragmentary state is so susceptible of forced and figurative interpretation, of utter reversal of meaning by ingenious emendation of text or reconstruction of context, that it has not carried with it the same immediate proof of its relative crudity, and modern criticism has sought in it not only the promise of future greatness, but a degree of clearness and consistency not to be found in Plato or Aristotle. It has seemed to assume that philosophy sprang from the brain of man, as her patron goddess from the head of Zeus, full-grown.

This tendency has been bound up with the inclination to view early philosophy as a self-developing dialectic, isolated from the influence of everyday experience and everyday modes of thought. It is better perhaps to over-emphasize the continuity of philosophy, than to treat each thinker as an individual isolated from those who went before him, but we can never hope to understand the perennial freshness and vitality of Greek thought unless we realize that it has its roots in constant contact with the fruitful soil of daily experience. Its history is to be viewed rather as a process of clarifying the confused but always significant notions of ordinary thought, than as a progressive creation of notions of its own with which to organize experience. This process, we may know beforehand, must be a very gradual one. Reflection becomes only very slowly aware of its own implications, and admits from common life notions so vague and shifting that later criticism cannot tolerate their presence and tasks its ingenuity to spirit them away. Even in the maturest minds we find constant employment of notions supposed to be clear simply because long familiar; we find distinctions newly drawn lapsing from memory; we find ideas shifting

their meaning unconsciously in passing from one phase of a subject to another; we find survivals of childish modes of thought amid most profound discoveries. Much more should we expect to find these features in the beginnings of philosophic reflection. Distinctions seem inevitable, once made. We find it hard to believe that men could ever have painted the eye full front and the face profile, yet the understanding of the beginnings of human effort in any realm requires the power to reconstruct in imagination the efforts of the past without employing distinctions subsequently made.

To these difficulties of interpretation are added, in the case of Empedocles, the especial problems set by the employment of highly poetic and imaginative imagery which nearly always obscures the meaning. The use of this imagery constitutes indeed a presumption that the thought is not over precise. Thought does not reach clear and accurate conceptions before command of language has been obtained, and unless the poet deliberately chose to conceal his thought, his ideas must be regarded as subject to the same limitations as his diction. It is conceivable that Empedocles should at times choose picturesque imagery to capture the ears of his hearers. Were his thought precise and abstract, however, he would surely, like Parmenides, often lapse into more logical modes of expression. We may well believe that much which seems to us consciously figurative was by the poet meant as statement of fact. It would be strange indeed if the mythological mode of conceiving the universe were completely abandoned from the very inception of philosophic thinking.

Quite apart from the question of the worth of the mythological point of view—and it certainly embraces truths that scientific eras have sometimes overlooked—it is not reasonable to suppose that a tendency so deeply rooted in the Greek nature could disappear otherwise than gradually. In so early a period as the one we are considering it must still have had profound influence. Present-day thought can hardly achieve a sympathetic relation with the mind of Empedocles at this point. The scientific way of looking at things has so effectively wrought itself into the fabric even of our instinctive thinking that we naturally regard as figurative and symbolical much that the poet meant literally. Only by conscious effort can we realize that personal qualities could be ascribed to any aspects of nature or that logical and imaginative motives could really be so interwoven as they are in Empedocles. In these respects Aristotle already belongs to a totally different world. In him begin the Procrustean methods of reducing this mobile and picturesque system to technical formulation. Aristotle's many and recurring perplexities are prophetic of the difficulties modern criticism

has encountered in its attempt to achieve the same task. To him with the entire poem at hand, just as to us with but the scattered fragments, precise definition seemed wanting at the points where it was most desired. This fact should warn us not to attempt to supplement too far or to interpret in too subtle a way, the information we possess.[1]

[1] The literature, both critical and imaginative, that has gathered around the name of Empedocles is very extensive. Only those opinions and interpretations will be noticed in the following pages, which demand present recognition. The invaluable contributions of early writers have for the most part been incorporated in later discussions, while the errors have nearly all been adequately refuted in the exhaustive treatment of Zeller.

LIFE AND CHARACTER

Empedocles was one of the men who take strong hold of the imagination of their fellows, and about whom a multitude of picturesque traditions naturally gathers to obscure the events of their lives. We know with certainty but a few meager facts concerning him and his activities. Most of these are entangled in a web of romance.[1] He was born at Akragas, at that time a flourishing city of Sicily.[2] His father's name was probably Meton, though tradition is not in entire agreement at this point. The father seems to have been a man prominent in political activity; the grandfather, named Empedocles, was apparently also a notable man, and an Olympic victor. These facts indicate that he belonged to a noble house and to a family of wealth and influence.

The dates of his birth and death we should be glad to know with certainty, since they have a bearing upon his relation to thinkers nearly contemporary; but though considerable thought has been given to the problem, certainty has not been reached. Diogenes tells us that according to Aristotle, he died at the age of sixty,[3] and Apollodorus places his *floruit* Ol. 84, that is, about the year 444 B. C. This would put his life approximately at the years 484 to 424 B. C. Zeller has made it seem probable that his life began and ended eight or ten years earlier.

In the political life of his native city Empedocles took a prominent part. Of this there can be no doubt, though it is hopeless to attempt to separate the authentic from the mythical elements in the accounts handed down to us. It is worth while to notice these traditions, since they give at least a probable notion of the direction of his activity. He seems to have been an opponent of tyranny. His first public act was said to be the bringing to trial of two men accused of a conspiracy to usurp the rule. His refusal of the kingship offered him and his dissolution of an oligarchical

[1] No attempt will be made to examine in detail the evidence concerning Empedocles' life. The facts will be outlined for their bearing on his philosophy. A very thorough and scholarly study may be found in Bidez, *La biographie d'Empedocle* (Gaud., 1894), a treatise whose general point of view will be noticed later.

[2] The chief authorities for this and the following statements is the account of Diogenes Laertius, viii, 51–77, and Suidas, who in his brief epitome cites some independent testimony. Both of these passages are quoted in full by Diels, *Vorsokratiker*, as well as the other important material concerning Empedocles' life.

[3] Other traditions are recorded by Diogenes.

assembly of a thousand reveal the same democratic tendencies.[1] His popularity and fame reached a high pitch, and in a visit to the Olympian games he is said to have received an ovation from the people there. His enemies, however, took advantage of his absence to bring about his banishment. He seems never to have returned to his native city. Stories are told of his extravagant affectations of dress and manner. Timaeus calls attention to the contrast between the disinterested character and moderation of the public acts ascribed to him and the ambitious claims and egotism of his poetry.[2] The two are not incompatible. Moreover, the political acts related seem of the sort that would attract public notice, and suggest the man to whom political life offers a sphere for brilliant achievement, not one whom pressure of circumstances forces into public life. This conclusion may be colored by the impression gained from his career as priest and wonder-worker. His claim to be a god is preserved to us not only by tradition, but in his own verse, wherein he describes himself in glowing language as attended by throngs who follow him expecting from him the help of medicine or magic.[3] There is no limit to the extravagance of his pretensions. He promises even to render his followers able to bring the dead back to life.[4] Tradition records of him works as wonderful as his claims; the restoring to life of a woman who had been dead thirty days, the cleansing of a river, the warding off of pestilences, the stopping of a deadly wind,[5] the checking of a cloudburst, the saving of a friend from murder by the power of music, and other performances of the same type. It is useless to attempt to ascertain the source of these tales. The story of the restoring of the dead woman may possibly have grown out of Fragment 111, as Burnet suggests, or it may have been a wonderful restoration from apparent death, as Diels confidently asserts.[6] It might, however, be a deception, possibly even a self-deception on the part of the wonder-worker. Essentially the same alternatives exist for many of the incidents. The only thing we may safely conclude from the fabric of marvels is that he was the type of man who inevitably gains a hold upon popular fancy. He must have

[1] Apparently this was an attempt to re-establish oligarchy after the death of Empedocles' father Meton, who seems to have been instrumental in originally instituting the democracy.

[2] It is here assumed that Diels' emendation of the corrupt passage, Diog. Laer., viii, 66, quoted *Vorsokratiker*, p. 158, is substantially correct.

[3] Philostr., *Vita Ap.*, viii, 7, p. 156; Empedocles, Fr. 112, 4.

[4] Fr. 111.

[5] The three incidents just named may be variations of one tale.

[6] Diels, *Sitzb. d. berl. Ak.* (1898) 410.

performed works of healing and conferred other practical benefits upon the people to a not inconsiderable extent, before he could become a popular hero of this sort. That he loved recognition and courted it by benefits conferred of various sorts is clearly reflected in his verses. Miraculous deeds are related of many famous thinkers and public men but to no one of the pre-Socratics save Pythagoras are so many beneficial works of a practical nature ascribed. Both men were prominent not only in the politics of their time, but also in religious reform and in medicine. Pythagoras' influence was distinctly deeper and more far-reaching in its scope, but that may have been partly because he belonged to a somewhat earlier age. The world of Empedocles was less ready to give unquestioning allegiance to a great reformer and wonder-worker.

The accounts of Empedocles' death tend to confirm the impression of a measure of charlatanism in his activities. However improbable may be the picturesque story that he cast himself into Mount Aetna in order to give the idea that he had been miraculously translated, the tale is significant of the way he had come to be viewed by the popular mind. The opposing accounts of his death from ordinary causes are evident attempts to remove this opprobrium. The treatment of his disappearance as an authentic miracle needs no special notice. Probably a mysterious mode of death or disappearance gave rise to the serious belief in some minds that he had been deified. It is not unlikely that he died in obscurity in the Peloponnesus, as one account relates.

It is important to notice the tradition connecting Empedocles with the attempt to found an empirical school of medicine in Sicily, since this has a bearing upon certain theories later to be discussed. Pliny and Galen are the most important witnesses to this effect, and confirmation is afforded by the great interest the fragments reveal in physiological matters.[1] Indeed, a large majority of his detailed observations upon natural phenomena are in this field. In them he shows a closeness of observation much greater than in the somewhat superficial fancies upon meteorology and astronomy. This would seem to indicate the stimulus of contact with other minds working upon the same problems, if not actual benefit derived from the results of their investigations. The degree of his indebtedness we have not the means of ascertaining. The influence of medical study is evident not only in specifically physiological matters, but probably in the development of the theory of four elements, as will be noticed later.

It is idle to attempt to reconstruct in a time-succession the events of

[1] Cf. Pliny, *Nat. Hist.*, xxix, 1, 5; Galen, *Meth. Med.*, A, 3, and other citations in Diels, § 3.

Empedocles' life or the various phases of his activity. Bidez pictures in a most fascinating way how the young man of boundless success and popularity in politics, in healing, and in mystic wonder-working, retires in later life in banishment to the utmost seclusion, where he delves into the secrets of nature and becomes the sober and conservative man of science. Diels assumes with equal confidence almost a reverse sequence of his activities. There is, indeed, no valid reason why they may not have been contemporaneous. History presents more than one instance of a simultaneous union of charlatanism and extravagant desire for acclaim, with sober and earnest scientific investigation. Renan has called attention to the parallelism in this respect between Empedocles and Paracelsus.

It is important not to overestimate the element of charlatanism in his character. The claims he made could hardly be made at the present time by a sane man in good faith. But eras of great and sudden advance in the scientific understanding of nature usually bring with them extravagant hopes and undue self-confidence on the part of leaders of thought. In Empedocles' time the sobering influence of past disappointment might well be even less apparent than in the time of the Renaissance, when a similar extravagance appeared. A conscious impostor he probably was not. The sincerity evident in his verses and the measurable results attained in his investigations presuppose a degree of seriousness of character and purpose incompatible with the deliberate impostor. But evidences from the same source make it clear that he could fall into extravagant estimates of his own powers. For he is a brilliant rather than a careful and patient investigator. He lacks the power to criticize, or even to correlate thoroughly his own results. This, in an age so untried in the art of gauging its own powers, combined with his passion for acclaim and influence may explain his position without assuming deliberate deception.

Eduard Meyer has called attention to certain characteristics of Sicilian temper and life which are interesting in relation to this estimate of Empedocles' character.[1] He suggests that the life of Sicily has more in common with the Orient than with the rest of Greece in certain respects, notably in the lack of restraint, sanity, and balance so strikingly evident in the Greek temper elsewhere. Charlatanism and magic would therefore find a readier soil here than in other parts of Greece. With regard to Empedocles, at least, it would seem that a happier analogy might be found. The root of the tendency toward magic and wonder-working is not with him a weak hold upon experience and a leaning toward mysticism as in the Orient, but an impatience of the slowness of sober investigation, and an attempted

[1] Eduard Meyer: *Geschichte des Altertums*, III, § 369; cf. § 365.

anticipation of the results which empirical science seems to promise. In this his temper is, as already noted, somewhat allied to that of the Renaissance. It is keen, inventive, imaginative, prolific in new ideas, but lacks the incisiveness, precision, thoroughness, and caution usually so characteristic of Greek thought.

RELATION TO OTHER THINKERS

The ancients were fond of connecting Empedocles' name with that of Pythagoras. This was partly due, no doubt, to the resemblance in their lives, but still more to the close relation between certain of their doctrines, especially the transmigration of souls and abstinence from animal diet. Some modern criticism has been inclined to accept without question this close relationship between the two, in some instances tracing most strained analogies in their systems. Tannery, for example, regards the main outlines of the *Physics* as growing out of Pythagoreanism.[1] Strife in its relation to the elements is the same as the void of the Pythagoreans. The alternate inspiration and expiration of the void by the plenum is replaced by the more mechanical alternation of motion and rest. Most recent criticism has been inclined to question the measure of indebtedness heretofore assumed. Even Zeller limits the influence of Pythagoras almost wholly to the doctrines of the *Purifications*.[2] Otto Kern and Dümmler attribute to the influence of the Orphics these religious doctrines.[3] It is quite clear that most of the ancient testimony upon this point is untrustworthy. The late Pythagoreans desired to bring the two reformers into close relation, and forged documents to that end. The letter purporting to be written by Telauges attempts to establish this connection through the teachings of Hippasus and Brotinus, but it is now universally admitted to be spurious. Many of the traditions recorded are glaring absurdities, as, for example, the assertion that he was the pupil of Pythagoras himself, by whom he was expelled for plagiarism, it being decreed thereafter that the doctrines should be communicated to no maker of verses.

In the teachings of the *Physics* there is no certain evidence of serious indebtedness to Pythagoras.[4] Some of the ideas of the *Purifications*,

[1] Tannery, pp. 314, 306.

[2] Zeller, p. 824.

[3] Cf. references on p. 10, 3.

[4] The doctrine regarding the sun may be an exception, but we are too little informed of the position of either of these two thinkers on this subject to make certain any connection between them. The fourfold oath of the Pythagoreans, Aet. i, 3, 8, even if it originated early, is no indication of an indebtedness of Empedocles to them in his doctrine of the elements. It is clear that the fourfold division of the elements existed

however, and in particular the theory of transmigration of souls, were in all probability derived from him. Burnet has made it probable that Pythagoras held this doctrine, resting his conclusion chiefly on the association by Herodotus of his name with that of Salmoxis, and upon the certainty that Pythagoras taught the allied doctrine of the kinship of men and beasts.[1]

If Alcmaeon was a Pythagorean, which is somewhat doubtful, our view of Empedocles' indebtedness must be modified. For in all probability he owed much to Alcmaeon in his doctrine of sense-perception, and possibly the indebtedness extends farther.[2]

In the case of the Orphics, from whom Kern supposes both the Pythagoreans and Empedocles to have gotten the theory of transmigration of souls and other doctrines, we are in the gravest difficulty when we attempt to get at the truth. It is a fact that the Orphic poems in their present form contain many striking parallels to the teachings of Empedocles. This extends not only to the special doctrine just noticed, but also to the springing up of human beings from the union of separate members, and to the supposed pantheism of Fragment 134. But we do not know when the Orphic poems were cast into their present form, and while some portions of them are unquestionably early, it is impossible to determine in individual points on which side the indebtedness lies. Indeed in some instances we may doubt that the correspondences mentioned exist. In the doctrine of the world-egg, for example, our evidence shows that Empedocles' universe is shaped not like an egg, but like a spheroid. Even if it were egg-shaped it would not be parallel to the notion of the Orphics, for their doctrine had reference not primarily to the form of the world, but to its original embryonic character. We may, however, accept the conclusions of Kern and other workers in this field to the extent of recognizing that Empedocles allied himself in his religious poem to the Orphic cult of his day,[3] and that his activities as a reformer were probably connected with the propaganda of

in current thought very early. Cf. Her. Bywater, Fr. 25; Diels, 76. The Pythagorean Harmony is even more alien in essence to Empedocles than is the Heraclitean, presently to be noticed.

[1] Cf. Burnet, p. 100. Rohde, 171[2], emphasizes strongly the influence of Pythagoreanism upon this and other doctrines of the *Purifications*.

[2] Upon Alcmaeon's relation to the Pythagoreans, cf. Arist., *Met.*, i, 5, 986*a*, 27. We gain a high impression of Alcmaeon as an observer from the few notices of him. For his influence upon Empedocles, see further pp. 77 and 83.

[3] Kern, "Empedocles und die Orphiker," *Archiv*, I, 498; Susemihl, *De Theog. Orph. Forma Antiq.*; Dümmler, "Zur Orphischen Kosmologie," *Archiv*, VII, 148; Maas, *Orpheus*, München, 1893. The latter regards the *Purifications* itself as an Orphic poem, an interesting though uncertain hypothesis.

that body.[1] It is easier to understand his inconsistencies if he was thus associated with a religious organization than if all his teachings were the outcome of the working of an individual mind.

It is tempting to consider Empedocles' thought as an attempt to mediate between the philosophy of complete motion as formulated by Heraclitus and of complete rest as taught by Parmenides. This is Aristotle's suggestion and is essentially Zeller's view of Empedocles' historical position.[2] Aside from the attractive definiteness of this mode of statement, a few doctrines suggest at first sight a connection between the two. Strife reminds us of Heraclitus' War, Love of his Harmony, a name actually used by Empedocles to represent Love.[3] The doctrine of effluences again has a definite relation to the earlier view of the constant flowing away of particles from objects. Nevertheless, a study of the two thinkers tends to lessen the impression of close kinship between them, and leads us to regard the influence of Heraclitus as at most rather an external one. The chief reason for this conclusion is the fact that of the most vital and significant ideas of the earlier thinker no trace is to be found in his successor. The notion of the universal flux of all things does not find adequate representation in Empedocles' world of motion. Empedocles lays, so far as we know, no special emphasis upon the instability of things in the present world, as a more universal and subtle fact than our senses would lead us to suppose. As Burnet puts it, "he is attempting to mediate between Parmenides and the evidence of the senses, not between him and Heraclitus."[4] In Empedocles' doctrine of Strife, again, there seems to be no real duplication of Heraclitus' notion of War. For the activity of Strife is throughout baneful and there is no trace of recognition of the fine paradox of existence therein involved, readily as it would fit into the outline of his system. We may say essentially the same of his notion of Harmony. In the doctrine of four elements, which Zeller regards as an extension of the Heraclitean three, there is no reason to assume historical indebtedness. For Heraclitus seems to be using merely the ideas of popular thought, of which traces are found as early as Homer.[5]

[1] The hymn to Apollo, referred to on p. 16, probably belonged to this phase of his activities.

[2] Plato's comparison of Empedocles to Heraclitus contains no allusion to Parmenides. Heraclitus is said to combine the notions of the one and the many in a simultaneous way as opposed to the successive periods of Empedocles.

[3] Fr. 27, 3.

[4] It seems strange that Zeller should regard as a concession to Eleaticism Empedocles' recognition that "das Werden und Vergehen im strengen Sinn nicht denkbar sind." None of the Ionians admitted generation and destruction in the strict sense.

[5] Homer, *Il.*, O, 189.

We must assume a somewhat closer relation to Parmenides.[1] Here again, to be sure, the earlier thinker far surpasses the later in his grasp of the great problem where they come into relation, yet there can be no question that Empedocles gave specific consideration to the objections Parmenides had raised to looking upon the changes of the world as real. His theory is by no means an answer to these difficulties, but the abandonment of a single element is in part motived by the desire to avoid them.[2]

Not only in this point but in certain other aspects of his system we find great indebtedness to Parmenides. In not a few instances the very phraseology bears witness to the relationship. The introduction to the poem, with its appeal to the gods "to turn from my tongue the madness of these men," and to the Muse "to send a chariot from the abode of piety," contains satirical reminders of Parmenides' introductory words. The emphasis upon the senses as a means of gaining knowledge, expressed in the same connection, evidently is motived by the conscious remembrance of Parmenides' injunction to reject the evidence of the senses.[3]

In the doctrine of alternating conditions of motion and rest, Zeller sees the influence of Parmenides' view that the manifold of sense is mere appearance.[4] This seems fanciful. There is no logical relation between the two ideas. The description of the Sphaeros by Parmenides doubtless suggested to Empedocles' imagination the picture of this movement in the world cycle; but the notion of the cycle as a whole has as its primary root the desire to put the life of the world into a compassable story with a genuine plot and a completeness to the imagination. Zeller attributes further to the influence of Parmenides the tendency to treat the elements as two instead of four, a tendency noted by Aristotle and easily remarked in certain parts of the poem. The influence of Parmenides here seems probable.

The denial of a void in the Sphaeros is so distinctly in the manner of Parmenides that it no doubt comes from him.[5] In certain minor problems of physiology we shall note later a connection between the two thinkers.

[1] No special weight can be given to ancient testimony on this point, because so much that is transmitted to us on Empedocles' relation to other thinkers is evidently false. Cf. Simpl., *Phys.*, 25, 19; D. L., viii, 55.

[2] Upon the defects of his solution cf. p. 42.

[3] Fragments 2 and 4.

[4] Zeller says also that Empedocles had taken over Parmenides' moveless matter. That this is an error will be shown (p. 35). In both of these points Zeller is followed by Windelband, 49, and by others.

[5] Cf. Fr. 13 and 14.

The relation of Anaxagoras and Empedocles raises a question rather of logical priority than of influence one upon the other. For it seems that both attacked the same problems at practically the same time, from similar points of view, but with no large measure of consideration of each other's theories. Eleaticism and sense experience, on the basis of their Ionian inheritance, set the problems for them both. Upon the question of logical precedence varying opinions have been held. The traditional account places Empedocles before Anaxagoras. Some modern treatments, notably those of Tannery and Gomperz, reverse the order on the ground that Empedocles is the more mature thinker.[1] Aristotle has given us a statement which bears upon the problem, but it is diversely interpreted. Anaxagoras, he says, was Empedocles' senior, but was "later in works" τοῖς δ' ἔργοις ὕστερος.[2] This may refer to the time when he made public his philosophical work, or to the merit of his theories. Bonitz and Diels recognize the two alternatives, but both rightly prefer the latter. Gomperz holds in a modified form the second alternative. Aristotle he thinks wishes to treat Anaxagoras after Empedocles because he is farther from the Monism of the Ionians.[3] This seems hardly a probable interpretation.

Even were we sure of Aristotle's meaning, his statement would not settle the question. The examination of the most fundamental teachings of the two thinkers seems to place Anaxagoras in advance of Empedocles. In the doctrine of the elements his position is the logical conclusion, perhaps we might say the *reductio ad absurdum* of the qualitative conception of element. Empedocles' position is more superficial, though externally nearer to the modern view. As will be shown elsewhere, a limitation of the number of the elements, when they are defined qualitatively, is a most palpable ignoring of facts.[4] Anaxagoras' νοῦς, too, is a much more clearly defined and mature notion, with all its defects, than Empedocles' Love and Strife.

Gorgias is said by tradition to have been Empedocles' pupil, and to have claimed that he himself had been present at the performance of magical tricks by his teacher.[5] It is generally recognized that little weight can be

[1] Ritter and Preller seem to have placed Anaxagoras first from the point of view of strict chronological sequence.

[2] *Met.* A 3, 984*a*, 11; cf. Simpl. *Phys.* 25, 19.

[3] Cf. Gomperz' note to p. 183. Gomperz greatly overrates Empedocles' theory of the elements, a fact which doubtless has influenced his interpretation of this passage.

[4] Cf. p. 42.

[5] D. L., viii, 59, citing Satyrus as authority. Repetitions of the traditions are cited by Diels, A, 2 and 19.

attached to traditions of this sort. Plato's *Meno* has been taken as evidence that Gorgias adopted Empedoclean physics as a whole or in part. It is very doubtful how much may be inferred from this passage. Socrates when pressed by Meno for a definition of color, asks,

Socrates. Do you want me to answer you in the fashion of Gorgias, which you can readily follow?

Meno. I do of course.

Socrates. Then do you agree with Empedocles' theory that there are effluences from things?

Meno. Yes, indeed.

Socrates. And passages into which and through which the effluences pass?

Meno. Assuredly.

Socrates. And some of the effluences fit given passages while others are too small or too large?

Meno. That is true.

Socrates. And you have an idea of sight?

Meno. Yes.

Socrates. Then, as Pindar says, "from this understand my meaning." Color is an effluence from things, commensurate with the sight and perceptible.[1]

From this passage Diels constructs almost a biography of Gorgias.[2] The definition here given he thinks must be, as it stands, quoted from Gorgias, probably from a lost work on *Physics*. In his maturity Gorgias asserted the impossibility of knowing nature, therefore it must have been written in youth. He must have adopted the teachings of Empedocles, but later have perceived their weakness. The factor which led to the breakdown of his faith in Empedoclean physics was the reflections of Parmenides, which he probably came to know through Empedocles' influence. He was thrown by this loss of faith in what he had before held so secure, into a period of despair and negation, in which he wrote his treatise on non-being. He recovered himself, in the third and final epoch of his life, only to the extent of taking refuge from scepticism in practical life and rhetoric.

But Plato's words do not prove that Gorgias ever seriously gave credence to the Empedoclean physics, or even to his explanation of sense-perception. It is quite as likely that he employed the doctrine of pores and effluences simply as an easy, though, for his day at least, a superficial mode of accounting for certain facts. His claim to polymathy involved the having a ready answer for all questions, and this theory of pores and effluences was a part of his stock in trade. It is not unlikely that he was in the habit

[1] *Meno*, 76 C.

[2] Diels, "Emp. u. Gorg.," *Sitzb. d. Berl. Ak.*, 1884, p. 343.

of throwing the responsibility for the theory upon Empedocles and his interlocutors as is done by Plato here, not committing himself to it, but simply aiming at an answer that would satisfy them. Possibly the use of the plural λέγετε is a touch of dramatization of Gorgias' manner in addressing, as he usually did, a group of hearers. The reason for Plato's identifying Gorgias with the definition instead of Empedocles alone, is obvious from the context. Meno is fascinated by Gorgias' polymathy, and Plato makes Socrates play upon this fact.

The relation between Gorgias and Empedocles in point of style will be considered later.

RANK AS A PHILOSOPHER

Of the general merit of Empedocles' thought the most diverse opinions have been held. Aristotle accords him no very high praise, yet he gives him more attention than any pre-Socratic thinker save Democritus. In all antiquity we hear of no individual or school that committed itself to his system, yet notices of his opinions are everywhere found, and more of his actual words are preserved than of any other of these early thinkers. Lucretius speaks of him with strong enthusiasm.[1] Among modern writers Diels regards his thought as "ein interessanter Eklecticismus," with little originality or thoroughness;[2] Tannery agrees essentially with this estimate;[3] Zeller looks upon him as an original thinker, who made a distinct contribution to the history of thought;[4] but Zeller's judgment is much more moderate than that of Gomperz, who strongly dissents from the charge of eclecticism, and accords him an exceedingly high place. Gomperz acknowledges Empedocles' inconsistencies, but attributes them to restless and eager reaching out into new fields, to the neglect of adequate correlation of results already obtained.

There is an element of truth in Gomperz' position, though he overrates Empedocles' importance. Great as is Empedocles' indebtedness to other thinkers, his defect is on the whole a lack of thoroughness rather than a lack of originality. He is clever but not profound. He is not a philosophic mind in the highest sense of that term, though he seized on many interesting and novel ideas. He does not scruple to accept solutions ready made, and without much regard to their harmony with his system as a whole, but most of his ideas are his own, and the general outlines of his thought are worked into a fairly well articulated whole.

[1] i, 729 ff.

[2] *Emp. u. Gorg.*, p. 343.

[3] P. 315.

[4] Zeller regards as Empedocles' most important contribution, his attempt at mediating between Eleaticism and the facts of change, and his advance in the working out of the notion of element.—Zeller, p. 836.

WRITINGS

Fragments have come down to us from two poems of Empedocles, *The Physics* and *The Purifications*. Other works were ascribed to him in antiquity. Aristotle is quoted by Diogenes Laertius to the effect that he wrote a *Prelude to Apollo* and a *Crossing of Xerxes*, as well as tragedies and political writings.[1] In the same account we are told that Heraclides doubted the authenticity of the tragedies, while Hieronymus claimed to have seen forty-three of them, and Neanthes to have seen seven.[2] The *Prelude* and the *Crossing of Xerxes* were burned, tradition relates, by a sister or daughter, because of their incompleteness, or as another account says, by accident. Zeller doubts that any of these notices rests upon the authority of Aristotle, and in any case our knowledge of the works extends no farther than the names. Of the two writings from which portions have come down to us, the authorship is not called in question. Diogenes tells us that the *Physics* and *Purifications* together were five thousand lines long, Suidas says the *Physics* was two thousand.[3] Diels makes it seem probable that the text of Diogenes is corrupt, and that the original had πάντα τρισχίλια instead of πεντακισχίλια.[4] In all there remain to us about 450 verses.

Stein distributes the fragments of the *Physics* into three books, following the authority of Tzetzes,[5] and the usual reading of Suidas.[6] Diels assigns the fragments of Stein's third book to the *Purifications*. His reason seems to be the lack of harmony in content between these fragments, whose theme is religious, and the rest of the *Physics*.[7] He notes that some important manuscripts of Suidas speak of two books instead of three, and that in others *two* was the original reading, having been changed by a later hand.[8] The

[1] D. L., viii, 57; Suidas tells us, apparently from Hesychios' catalogue, that besides the two works known to us from fragments he wrote "many others." There is an important allusion to the "Hymn of Apollo" in *Men.* (*Rhet.*) Spengel. 1, 2, 2.

[2] The last statement is based upon Diels' emendation of Diogenes.

[3] Wellman, Pauly, *Realencyc.*, credits Diogenes with the statement that the *Purifications* contained 3,000 verses.

[4] Diels, *Berl. Sitz.*, 1898, 396.

[5] Tzetzes, *Chiliad*, vii, 522.

[6] Cited Diels, *Vors.*

[7] Diels, as cited in n. 4.

[8] He thinks through the influence of Tzetzes. Diels has been at great pains to adduce external evidence for his position (cf. *Poet. Fr. ad fr.*, 131), but his points seem a little strained. His thesis, however, is not an impossible one.

division into books was probably not made by Empedocles, and the only question of importance is whether the disputed fragments belong to the *Physics* or not. This problem will be considered at a later time.[1]

The title of the *Physics* περὶ φύσεως appears not to have meant "concerning nature," nor yet "concerning the primary substance" as Burnet supposes, but probably "concerning becoming" or "concerning the formation of things."[2] Against Burnet's view may be urged the following considerations. Of the three passages which he cites as associating the term in the sense of primary substance with early philosophy, the first, from Plato's *Laws*, tells us merely that the thinkers in question meant by φύσις the "primary generation of things" τὴν περὶ τὰ πρῶτα γένεσιν.[3] This by no means limits their theme to the search for the primary substance. It may quite as well suggest the story of the genesis of the world, and the process of world building. Even with this broad interpretation, however, too much significance should not be attached to Plato's statement in this connection. Plato's point is that these thinkers tended to regard as "nature" and as "natural things" those existences that were first in time, that is, certain forms of matter. This does not determine the meaning of the title of their work. We could not say that the title "morals," if it were affixed to a utilitarian book, had the meaning "expediency." As a title, it is to be taken in the ordinary acceptation of the term at the time the book is written. The passage from Aristotle's *Physics* specifically states that the use of φύσις for material constituents, is defended by Antiphon on the ground that these are the οὐσία, or essence of a thing.[4] Clearly, if this be true, the word cannot as such suggest the simple meaning "primary substance." The third passage cited by Burnet, from Aristotle's *Metaphysics*, must be interpreted in the light of the *Physics* passage, as well as of the suggestion Aristotle makes a little later, that all the various uses of the word φύσις are a transference of meaning from its use as οὐσία, and have some implication that the thing so denominated is their essential nature.[5] This statement, while clearly untrue to the history of the word, is yet not without significance for the present question.

We may urge further against Burnet's position that the search for the primary substance is by no means the main interest of the pre-Socratic thinkers. Disproportionate prominence has been given to this aspect of

[1] P. 90.

[2] Burnet, p. 12.

[3] *Legg.*, 892 C. Cf. the term γένεσις as used a little later, 896 A.

[4] *Phys.* B. 1, 193 *a*, 9 ff.

[5] Δ 4, 1014 *b*, 32; 1015 *a*, 13.

their thought by Aristotle, following the trend of his own persistent problems.[1] This we conclude from the spirit and character of the fragments we possess. Those which deal with this problem are so few in number and so brief, so little is transmitted to us concerning the grounds of the doctrines held, so intense and vital seems the interest in problems of world building, of astronomy and physiology, that we are inclined to regard these problems as the more important side of their thought.[2]

The suggestion has been made above that the meaning of the word as a book title would probably reflect the current acceptation of the term. The word had already various meanings, and it is not easy to say which is the most important, or to reproduce that thought in an English equivalent. The term "Nature" as used by us is equally complex, but it has associations arising from later modes of thought.[3] Moreover, it does not preserve its etymological suggestions to the extent that is true of the Greek word. Aristotle gives as his first definition of *φύσις, ἡ γένεσις τῶν φυομένων*, and as a synonym *τὸ φύεσθαι*, and in a well-known passage of Empedocles not only is the root meaning employed, but it is implied that men currently use the term in this sense. "There is no becoming (*φύσις*) of things that are, nor any end in baneful death, but only mingling and separation of things mingled; but by men it is called 'becoming.'"[4] These instances[5]

[1] Subsequent writers in the main follow Aristotle. The relative ease of apprehending, stating and contrasting various views regarding the primary substance also has contributed to the prominence of this question in subsequent writers upon the pre-Socratics.

[2] Note the nature of the promise given by Parmenides of things to be discussed, Fragment 10, and Xenophon's offhand statement of the search of these early thinkers: *περὶ τῆς τῶν πάντων φύσεως*. It is *ὅπως ὁ καλούμενος ὑπὸ τῶν σοφιστῶν κόσμος ἔφυ καὶ τίσιν ἀνάγκαις ἕκαστα γίγνεται τῶν οὐρανίων*, Xen. *Mem.* i, 1, 11. The form of statement of the problem of the primary substance in the fragments of these thinkers seems usually to suggest the question in the form that lies closest to the old mythical mode of approaching it, "what have things come from," and "how did they come from it," rather than "what are things made of." In other words the time form of statement, the "world-story" is often the aspect in which the question is suggested by the philosopher's own words. Cf. Her., Fr. 30; Xenoph., Fr. 27, 33; Anax., Fr. 1. Note also the importance in Anaximander and Anaximenes of the thought of the infinite substance as an inexhaustible reservoir, from which have come and are coming the things of this world.

[3] These are chiefly suggestions of teleology, and a tendency to make an abstraction of nature as an entity. The later use of *φύσις* in Greece had somewhat the same associations.

[4] Fr. 8. Hardy, *Begriff der φύσις*, p. 21, can hardly be right in inferring from this fragment that Empedocles wished to give the term *φύσις* the meaning "Verbindung u. Trennung."

[5] Cf. also the passage of Plato referred to.

show that the verbal idea could naturally be suggested by the word, and it seems not at all unlikely that it had this meaning if employed as a title to these early treatises. The most frequent use of the word up to this time seems to represent the nature of a given thing in the sense of its "construction" or "make-up." So it is used in Homer of the plant given Odysseus.[1] "He showed me its nature; it was black at the root and had a flower like milk." Something like this must be its use in the two fragments of Parmenides where the word occurs, in Heraclitus, Fragment 1, and in the two instances of the word's use in Empedocles, besides the passage cited.[2] We may reasonably conclude then, that Empedocles called his poem "concerning the formation of things," with just the double suggestion that is contained in the English phrase, that is, "how the world was formed" and "what is its present organization."[3]

[1] *Od.*, κ, 303.

[2] Parmenides, Fr. 16, 3; Fr. 10, 5. Empedocles, Fr. 63; Fr. 110, 5. Epich., Fr. 4, φύσις is personified.

[3] The common use of term meaning "stature" or "bodily make-up" by Pindar and others has not traveled far from this use in the philosophers. It is not beyond the range of possibility that the early thinkers employed as a title a phrase used by Xen. *Mem.* i, 1, 11, περὶ τῆς τῶν πάντων φύσεως.

STYLE

In few writers in the whole range of literature are the artistic and the scientific impulse so fused, as in Empedocles. Plato in many respects furnishes the nearest parallel, although he is capable of a degree of logical abstraction that excludes poetic expression. Lucretius, with whom Empedocles is most often compared on this point, furnishes a striking contrast. Lucretius is not lacking in poetic power—far from it. But the two types of interest alternate in him; they are not fused. His poetic passages are interspersed among abstract discussions to which the poetic form is accidental. There are few passages in Empedocles where the poetic form is a matter of chance. He stands as the unique link between the mythological, poetic way of looking at the universe, and the scientific. His imagery is not adornment; it is integral to the main structure of his thought and cannot be detached from it. It is difficult for moderns, as it was for Aristotle, to avoid conceiving him in purely logical terms, reducing his system to abstract formulation, but when this is done his thought is not truly apprehended. In determining his contribution to the history of certain scientific concepts it is allowable to treat him in this partial way. But to interpret him as a whole, the imaginative, poetic side of the man must not be detached from the philosophical. When it is said that Empedocles was more of a poet than Lucretius or Parmenides, it is not meant that he had a better grasp of artistic expression, but that his original conception was poetic. The poetic form and imagery never cloaked an abstract skeleton.

This fact, as has elsewhere been noted, has much to do with the peculiar difficulty subsequent writers and thinkers have had in ascertaining his exact meaning in reference even to such concrete problems as the method of vision. Aristotle consequently accused him of deliberately employing poetic language to cheat his hearers, when he was at a loss for something to say.[1] But this is altogether unfair. Imaginative vividness took hold of him with more persuasiveness than did logical consistency, and he inevitably baffles minds not constituted like his own. The important thing in understanding him is to stop thinking at the right moment. On almost every problem his thought, when pushed beyond a certain point, presents

[1] *Rhetoric*, Γ 5, 1407 *a*, 33; cf. *Meteor* B 3, 357 *a*, 24.

contradictions and absurdities; up to that point, it is singularly suggestive and clear.[1]

The question was sometimes asked in antiquity whether Empedocles was a poet or not. Such an inquiry implies a strange lack of perception and seems to have had no other root but a feeling of the inherent incompatibility of philosophical thinking with poetic form.[2] The feeling is indeed warranted, for philosophic thought usually implies an abstract precision quite alien to the richness of associative suggestion essential to poetry. But Empedocles' thinking is chiefly imagining, and just because he was something less as a philosopher, he is more as a poet, or at least more uniformly poetical. Yet even Aristotle falls into confusion on this point, and assures us that Empedocles and Homer have nothing in common save the meter, and that the former should be called a writer on nature rather than a poet.[3] He had elsewhere, however, described him as "Homeric," and had called attention to his power in diction and to his employment of metaphor and other poetic figures.[4] The second passage shows how the first should be interpreted and indicates that the denial to him of the name poet is due simply to his subject-matter.[5] Cicero, and Lucretius also, seem to have recognized his poetic merit.[6]

Empedocles' verse is not without its defects, chiefly in the direction of an over-exuberance of fancy, and a fondness for striking and even startling modes of expression. Such, for example, are the description of the ear as a "fleshy sprout," of milk as a "white putrefaction," of the first forms produced as "whole-natured," of the strange combinations of animals as *βουγενῆ ἀνδρόπρῳρα*, as, *ἀνδροφυῆ βούκρανα*, and as *εἰλίποδ' ἀκριτόχειρα*, phrases which no effort of the English language can reproduce. His imagery is for the most part appropriate and happy, however, and very often full of picturesque vividness and originality.

Empedocles shares with his predecessors a directness of address and a constant use of pronouns of the first and second persons that sound strange

[1] Of course the element of conscious art is not absent from Empedocles' poetry, but his art was in essential harmony with his thought.

[2] Lactant. *Inst. Div.*, ii, 12, 4; Schol. *ad Dionys. Thrac.*, 734, 11; Plutarch, *De aud. poet.*, 2, 16 C (*Vors.* 23, 24, 25). One is surprised to find even Burnet assigning accidental reasons for Empedocles' employment of poetic form (p. 216).

[3] Arist., *Poet.* i, 1447 *b*, 17.

[4] Diog. Laert., viii, 57.

[5] Later statements to this effect are in the main repetitions of Aristotle, not independent judgments. Cf. the passages cited by Usener, *Münch. Sits.*, 1892, 606.

[6] Cic., *De Or.*, i, 50, 217; Lucr. i, 730.

to modern ears. He follows also the tradition of Greek philosophy in his outspoken censure of the views of others. Not only as revealed in these points, but throughout almost the entire work, an emotional tone characterizes it to a greater extent than is usual among the pre-Socratics. Heraclitus alone is comparable to him in the intense feeling attending even his most impersonal thought.

Aristotle tells us that Empedocles was the inventor of Rhetoric, as Zeno of Dialectic.[1] Recent critics seem to be in substantial agreement that this refers not to the formulation of scientific rules or to the teaching of Rhetoric as a distinct art, but rather to the practice of thoughtful elaboration of his speeches by which his work became a significant foundation for subsequent thinkers who put into systematic form the rules of the art.[2] He was doubtless a man of great eloquence, and his political influence was probably due in large measure to his skill as an orator.

Diels regards Empedocles' relation to Gorgias in this connection as an exceedingly close one.[3] He gives some weight to the doubtful tradition that Gorgias was his pupil[4] and regards the highly conscious and artificial style of the rhetorician as largely formed through the poet's influence. His attempt to find Gorgias' σχήματα in Empedocles' poetry seems not wholly successful, although we cannot deny as does Blass that his verse, more than other early poetry, contains certain artificialities of diction and sentence structure that are usually regarded as characteristic of Gorgias. Conscious balance of clauses, paronomasia, and the use of striking compounds, are among the artificialities noted by Diels; but the resemblance is not close enough to prove a direct relationship between the two. Norden's attempt to establish the indebtedness of Gorgias and Empedocles, in independence of one another, to Heraclitus at those very points is significant.[5] The figures in question, while used so extensively by Gorgias as to be looked upon as characteristic of his style, probably represent to a certain extent the rhetori-

[1] D. L., viii, 57; ix, 25; Cf. Sext. Emp., vii, 6; Quint., iii, 2; Suidas (Diels, *Vors.*, §§ 5, 19).

[2] Blass, *Attische Beredsamkeit*, p. 16, is inclined to think that Empedocles' claim to universal wisdom and his wandering life had influence in allying his name with that of the Sophists, and consequently in associating him with the beginnings of Rhetoric. It may be well to note the omission of specific mention of Empedocles in Arist. *Soph. El.*, 33, 183 *b*, 29, an omission that would be surprising were his contribution to Rhetoric other than has been defined.

[3] *Emp. u. Gorg., loc. cit.*

[4] Satyros acc. to D. L., viii, 58 (cf. Quint., iii, 1, 8).

[5] Norden, *Die antike Kunstprosa*, p. 17.

cal tendency of his time, and were used more or less by many speakers and writers then and earlier.

The discussion of Diels, inconclusive as it is, is very subtle, and throws an interesting and significant light upon the characteristics of style and thought which Empedocles shared with the Sicilians, upon the exaggerations of his style, and upon his kinship in temper and style with the Sophists.

THEORY OF KNOWLEDGE

In the exordium of his poem Empedocles impressively urges upon his hearers the importance of recognizing the true limits of their knowledge. The temper in which this exhortation is given is far from that which the theme would suggest to a modern mind. The words are those of a seer who would keep sacred the mysteries he has beheld, and would rebuke the presumption of other men who claim to understand the world, not the words of the scientist who realizes the need of a cautious method of research.[1] A theory of knowledge is not formulated here or elsewhere in the poem. We look in vain for any answer to the question what the exact limits of knowledge are; how we are to distinguish truth from falsehood; what is the relative value of, and the relation between, rational and sense knowledge. Not only in the fragments handed down to us does light fail us upon these points, but their spirit makes it clear that in the complete poem they were not treated. There are many lines which, taken without their context, or without comparison with statements made elsewhere, might lead, indeed have led, to the imputing to him of a pure empiricism, "have no more faith in sight than hearing;"[2] or of scepticism, "these things cannot be apprehended by the eyes or ears of man, or grasped by the mind;"[3] or of

[1] In the passages cited it is interesting to note that the phraseology is always ethical and not logical. For example speaking "more than is right" is what he prays to avoid, not "speaking more than is true." This is distinctly of a piece with Empedocles' general habit of thought.

[2] Fr. 4, 10. From this and the following lines exactly opposite conclusions have been drawn. Burnet follows Stein in placing a comma after l. 12, but seems wrongly to infer that only through the senses can knowledge enter our minds. Karsten places a full stop after l. 12, interpreting the passage, and in particular l. 13, as implying rationalism, and distrust of the senses. Mullach accepting this punctuation, increases the rationalistic color by unnecessary emendation. The MSS read μήτε τι (or τιν') ὄψιν ἔχων πίστει πλέον ἢ κατ' ἀκούην; Mullach reads μηδέ τιν' ὀ. ἐ. πιστοῦ π. ἢ κατὰ κούρας. Tannery translates this and the following lines, "mais ne crois pas voir plus que ne te montrent tes yeux, entendre au delà de ce qui est clairement énoncé, et de même pour toutes les voies qui s'ouvrent à la pensée, suspends la confiance en tes sens; pense chaque chose en tant qu'elle est manifeste." Zeller had formerly accepted this interpretation, but abandons it (804, 2) in favor of Stein's reading. He still attributes to Empedocles the view that reason is authoritative as over against the senses, but not on the basis of this fragment.

The passage really asserts neither sensationalism nor rationalism. νόει here means simply "apprehend" and implies no distinction of knowing from perceiving with the senses. We are told to apprehend each thing by the appropriate means.

[3] Fr. 2, 7.

rationalism, "(Love) do thou behold with thy mind and do not with thine eyes sit dazed."[1] But a comparison of these passages with one another, with their entire context, and with the work of the poet as a whole shows that no "method" is clearly thought out and differentiated from other modes of inquiry. There is an evident protest against such distrust of the senses as Parmenides had expressed,[2] and emphasis is placed upon the truth obtained through them, but not such as gives warrant to Burnet's statement, "(The senses) are the only channels through which knowledge can enter our minds at all."[3] There is no indication of distrust of independent reasoning processes, save such as is quite as insistently urged for sense.[4] [Our powers are straightened] . . . . "and these are things the eye of man hath not seen nor his ear heard nor his understanding comprehended; and so thou, since thou hast thus turned aside, shalt learn no more than mortal wit has brought to light."[5]

Whether the poet regards the limitation of our powers as ultimate is a question that has often been asked. Taken literally the passage might yield that meaning, yet it seems to be a rhetorical and not a scientifically precise statement. Bidez suggests that the poet has reference rather to the insufficiency of our knowledge than to our incapacity for knowledge.[6] Yet even this statement puts the thought in an atmosphere foreign to it.

The materialism of Empedocles does not prove anything regarding his theory of knowledge although empiricism is involved in modern thought of this type. "The blood about the heart" may have its independent activities and modes of apprehending the truth.[7]

[1] Fr. 17, 21.

[2] Cf. Parmenides, Fr. 1, 34, ff., with Empedocles, Fr. 4, 10.

[3] Burnet, p. 238.

[4] Cf. the fragments quoted above.

[5] A comparison of the exordium of Parmenides' poem with that of Empedocles, makes it probable that Empedocles is by implication satirizing Parmenides, especially in Fr. 2, 9, Fr. 4, 5 ff., and 10 ff.

[6] Bidez, "Observations sur quelques fragments d'Empedocle et de Parmenide," *Archiv*, IX, 190. Bidez treats the three fragments of Empedocles he has selected in too isolated a way and ascribes to Empedocles too explicit and conscious a method. It may be doubted that Fragment 4 favors giving exclusive attention to the study of particular phenomena, as distinguished from the large outlines of things. Still less is Fragment 111 evidence that practical fruitfulness is made the test of efficiency of the method employed. Bidez' recognition of Parmenides' antithesis of ἀλήθεια and δόξα in Empedocles' contrast of the unchangeability of the elements to the popular view of creation and destruction, may well be questioned.

[7] Fr. 110 clearly suggests the growth of thought from within.

GENERAL OUTLINES OF THE WORLD-STORY

The weakness and the strength alike of Empedocles' thought can be comprehended only when it is seen in perspective. What is to a certain extent true of all philosophic systems, is especially true of his, that it has its focal points where his attention is concentrated with illuminating insight, and its shadowy portions where many inconsistencies lurk unobserved. The focal points of modern thought are not his, and the searchlight of our criticism makes the inconsistencies very glaring. It is, for certain purposes, important to note these inconsistencies. It is also worth while, however, to reconstruct the picture as he saw it, bringing into clear relief the points that were for him central. If we do this, we shall put into the foreground not the problem of qualitative change, nor the nature of the elements, though these questions have relevancy for his thought. The thing that chiefly interested him was the cosmic process taken as a whole; the drama of world-building and world-dissolution.

No thinker has ever comprehended the process of the universe, past, present, and future, into so compact and complete a picture as has he. The picture is a product of the imagination more than of the reasoning faculty, and from the point of view of a soberer age seems adventurous in its scope. As a poetic construction it is magnificent, and its venturesomeness need not surprise us in an age when the weakness of fancy's wings had not yet been demonstrated in the school of experience. It was the power of this comprehensive scheme of things to rivet the attention, and to set satisfying limits to inquiry, that gave it its influence. It was not wholly without merit from a more scientific point of view. Our daily experience of a world of conflicting tendencies has its well-articulated place in the system, and gains meaning when considered in relation to it. Besides this, the notion of an ever-recurring cycle of change is easily derivable from an observation of such phenomena as the seasons, and the successive generations of man's life. Yet its chief hold lay not in its ability to explain the facts of experience, but in its imaginative vividness. The cosmic story, the story of the building of worlds, is its main theme. The world process is conceived not abstractly and analytically, but concretely and with vivid sensuousness. Many problems are considered in Empedocles' poem, but they all should be looked at in relation to this, his main scheme. The poem places them in that relation. In form it is strictly a narrative poem.

It traces in their time succession the steps of the world process, and the problems taken up by him all fall into place in this plan. Even the discussion of the elements is not primarily an analysis of the structure of things, but of their origin. What do things come from, and into what will they be resolved? The doctrine of four elements is an absurdity as an analysis of the present phenomena of sense. From the point of view of historic genesis it gets its only meaning and justification.[1] The same is true of many other doctrines put forth by Empedocles. They must all be seen in relation to the focal point in his thought, namely, the process of world transformation, "the world-story."[2]

In a treatment of Empedocles' philosophy like the present one, chief attention is necessarily given to the mooted points, and the true perspective of the system is lost. It is important to recognize this fact, and after discussion to restore the disputed aspects of the system to their true subordination.

The world-story as related by Empedocles may be briefly outlined. There are four "roots" from which come all the things that are and were and ever shall be. These are earth, air, fire, and water. They are constantly coming together into one, and being dissolved again into a manifold. This great rhythmic movement in the life of the universe, this union and dissolution, repeat themselves endlessly, and are brought about through the uniting power of Love, and the separating power of Strife. A world of "mortal things" is effected twice in each cycle, during the intervals when Love and Strife are contending for the mastery. When the four elements were entirely separated by Strife, there was no world; but Love entered into their midst and grappled with him in fierce conflict, winning over from him more and more of his realm. Her increasing sway is betokened by the uniting of separate elements in varying combinations, and by the formation of an organic world with its infinite variety of individual existences. But, as she repels her enemy more and more, this organic world gives place to perfect union, the complete mingling of the elements into one, the Sphaeros, wherefrom Strife is wholly banished. But this banishment is not forever. In the fulness of the allotted time he re-enters, and sends a shudder through the "members of the god." He parts off the aether and

[1] The characterization of the elements as "roots" *ῥιζώματα*, Fr. 6, and as the "spring" *πηγή*, Fr. 23, 10, from which things come, accords well with this position.

Note that Fr. 17, ll. 11–13, the permanence of the world is based not upon abiding elements whose qualities are unchanging, but upon the recurrence of an alternating cycle wherein they are one of the moments.

[2] We have seen reason to think that the title of the poem, *περὶ φύσεως*, has in it this suggestion.

fire of the heavens from the earth, and wins back, little by little, his control. The present world is the battle-ground of the struggle that is taking place, a struggle in which he is sure to win, but just as sure, thereafter, to be forced to yield his sway.[1]

A number of points require consideration before the detailed description of the separate stages of this process is taken up.

[1] Most of these points are well attested and so often repeated that specific references need not be given. The few doubtful features will be discussed in the following pages. The important sources are collected by Diels, *Vors.*, 28 ff.

THE ELEMENTS

The theory of elements presents some problems. Empedocles employs often the conventional names, earth, air, fire, and water, but he also speaks of them as Zeus, Hera, Aidoneus, and Nestis.[1] The context shows clearly that Nestis is water, but the identification of the other three is very doubtful, and has occasioned much discussion. Zeus is described as "bright" or "gleaming," Hera as the "bringer of life." Plutarch tells us that Zeus was the aether, by which he unquestionably means fire, that Hera was air, and Aidoneus earth.[2] Most modern writers have accepted this view. Other ancient authorities say that Hera is earth and Aidoneus air.[3] This has been shown by Diels to be a false tradition coming from the Homeric allegorists who wished to find in Homer the father of all philosophy.[4] Homer had characterized Hades' realm as the region of murky shadows, ζόφον ἠερόεντα,[5] and had specifically denied to him control over earth. The identification of Hera with earth in the writers mentioned, Diels believes, is also due to epic tradition, since the epithet applied to her by Empedocles, φερέσβιος, is used of earth by Hesiod, and in the Homeric Hymn to Apollo.[6] But the identification of Hera with earth has recently been approved, though on grounds independent of these ancient witnesses. Knatz, Thiele, and Burnet maintain, along with this identification, the novel position that Zeus is meant by Empedocles to represent air, and Aidoneus fire.[7] Zeus they urge is always associated with the bright sky in the minds of the Greeks, and Empedocles' use of αἰθήρ to characterize this element shows that it was the bright, pure, upper air which was meant, not the mist that was in early thought called ἀήρ. Aidoneus, they suggest, is an eminently appropriate name for fire, in a land so familiar as Sicily with volcanic

[1] Fr. 6.

[2] Aet., i, 3, 20.

[3] Stob., i, 10, 11; Her., *Alleg.*, 24; Hippol., *Ref.*, vii, 29; D. L., viii, 76; Athenag., *Suppl.*, xxii, 95. Men. (*Rhet.*), Spengel, iii, 337, 4, Hera figures as air, but this evidence has little weight.

[4] Diels, *Dox.*, pp. 89 ff. By further citations from Her., *Alleg.*, 41, and Plut., *Vit. Hom.*, 97, Diels has made certain the connection between the passages referring to Empedocles in Stobaeus and Heraclitus, and the discussions of the view of the elements attributed to Homer.

[5] *Il.*, O, 191.

[6] Hesiod, *Theogn.*, 693; Hom. Hymn, ii, 163.

[7] Knatz, *Empedoclea*, Bonn, 1891; Burnet, p. 241; Thiele, *Hermes*, XXXII, 68.

eruptions and hot springs. Thiele asserts that the countrymen of Empedocles undoubtedly saw in the fire mountain of Sicily the god of the underworld, "wie schon die Legende von Empedokles Tod beweist." The validity of this last assertion is not apparent. The associations further connected with the name of Aidoneus are so full of gloom and shadow, that fire is the last element his name would naturally suggest. By Empedocles, fire is constantly thought as "gleaming," and for the most part as associated with the heavens. While he remarked, as Knatz points out, that many phenomena are occasioned by the fire that lies under the surface of the earth,[1] we know that in his thought this was not the proper abode of fire, for in the first separation the main portion of it was carried out of the mixture to the farthest limits of the universe.[2] The epithets ἀγώγιον and διδηλον used of fire, do not imply its association with Hades. Neither word in its primary meaning has any connection with that region or with its deity. Earth, it would seem, is the element most naturally associated with his name.[3]

As for Hera, it is true that "life-bringing" is an epithet particularly appropriate to earth. Yet it is often used of other things, and would aptly describe air, especially since, in Empedocles' view, breath is so important in sustaining the life of man and other living creatures.

In extant literature before Empedocles, no definite association of Hera with any of the elements is found. Later she is sometimes associated with earth, but still more often with air, partly on the basis of a false but plausible etymology in Plato's *Cratylus*.[4] There is, therefore, no valid objection to identifying her with air, as is done by the best ancient tradition.

In calling Zeus αἰθήρ ancient authorities undoubtedly mean to describe him as fire.[5] Aether came to mean fire later,[6] though it seems clear that in Empedocles it did not have that meaning.[7] Their confusion on this point

[1] Plut., *Prim. Frig.*, 19, 4, p. 953 E (cf. also Fr. 52).

[2] Aet., ii, 6, 3.

[3] Too much significance should not be attached to the fact, noteworthy though it is, that Hades may have been originally the god of earth rather than the god of the dead. Welcker, *Griech. Götterl.*, I, 399. Note his connection as Pluto with the wealth of the earth, and his name Zeus Chthonius.

[4] *Cratylus*, 404 C; Hymn. Orph., xvi is an apostrophe to her as the goddess of air.

[5] Knatz's objections to this hardly merit serious consideration. The activity expressed in the word ζέσις used as descriptive of aether, is in keeping with Empedocles' spirit. Fire is with him by no means "materia patiens," as Knatz calls it, but is highly active. Cf. p. 35.

[6] Cf. Arist., *De Caelo*, Γ 3, 302 *b* 4.

[7] In several passages aether and fire are mentioned as distinct. Tannery is there-

is enough to vitiate the value of the evidence of these writers, yet it seems most natural to associate Zeus with fire. His home is, to be sure, in the upper air, as is abundantly witnessed by the poets, but he is not identified with it. The home of fire is also in the high heavens. "Gleaming," while an epithet that might well be used of aether, is more suggestive of fire, and is often used to describe the fiery thunderbolt, the chief manifestation of Zeus's power.

These considerations make it seem wise to adhere to the conventional view upon the reference of these mythological names, though a large balance of probability cannot be claimed in favor of so doing.

We have noticed that the common word in Empedocles for air is *αἰθήρ*. *ἀήρ* is, to be sure, used not once, as Burnet supposes,[1] but several times, unless we have recourse to emendation. In one instance it was clearly used to denote the element,[2] in two others, probably in a third also, it refers to the ordinary atmosphere.[3] In the last passage it is distinguished from *Τίταν αἰθήρ* by the epithet "moist." It seems impossible on the basis of this evidence to draw any sharp distinction between the two terms. Both are used for the element, and both for the atmospheric air. We may not doubt that *ἀήρ* was the more usual word in the latter meaning, and that as the lower atmosphere evidently contains a large admixture of water, the word was naturally used for moist air.[4]

We may note in this connection the entire absence in Empedocles of any tendency toward the development of a technical diction. "Sea," "water," "rain," are used quite indiscriminately, as are "fire," "sun," and "Hephaestus." His imaginative temper has not in it the logical precision which demands and develops technical terms.[5]

It seems probable that the formulation of the doctrine of four elements

fore in error in describing fire as "l'air lumineux," p. 312. See Empedocles, Fr. 71; 98; 109; and 115, 9.

[1] P. 241.

[2] Fr. 17, 18.

[3] Fr. 100, 13; Fr. 78. The doubtful fragment is 38. On its interpretation cf. Zeller, 758, 3.

[4] The word as used in Homer does not mean mist in the sense of implying watery constitution. In this respect it is like our word vapor. Its most frequent use in Homer is of the miraculous vapor thrown around people and things to make them invisible. It is also used of the lower atmosphere *Il.*, Ξ, 288. It is not strange that in Empedocles the use of the term as element should co-exist with the looser meaning.

[5] Zeller, p. 758, 3, enumerates the various names used by Empedocles to denote each of the elements. It is interesting to see his fondness for concrete terms such as "sun" for fire, "heaven" for air, "sea" or "rain" for water.

was the result partly of observation, partly of a priori reasoning. Eleatic criticism made necessary the abandonment of the single element of the early Ionians. The limitation of the number to four, earth, air, fire, and water, was based upon observation of ordinary nature. Three of these are great and obvious divisions of the material world, while fire is a striking process of nature inevitably supposed in antiquity to be a material substance.[1] Burnet gives as the reason for choosing these four, that he thought they sufficiently accounted for the qualities presented by the world to the senses.[2] This can be true only in a rough way, for Empedocles is at no pains accurately to differentiate their qualities. Fire and aether are both "bright" and both "warm."[3] Still more questionable is the assertion made in antiquity that the abstract qualities heat and cold, rare and dense, or moist and dry, furnish the starting-point of the theory.[4] Aristotle tells us that in the actual working out of his theory, Empedocles did not treat the elements as four, but only as two, opposing fire to the other three.[5] In the existing fragments and notices the antithesis of fire and water, or of hot and cold frequently appears, especially in dealing with physiological matters. This would seem to indicate the influence of other thinkers, perhaps of Alcmaeon and contemporary schools of medicine.

The mythological names used for the elements have no great significance. Their employment seems to be merely a play of fancy. Thiele supposes there is present a desire to make these novel doctrines acceptable to his countrymen, by clothing them in mythological phraseology. At the same time, Thiele thinks, he conceals under this cloak a subtle satire of popular belief. The series of personified daemons in Fragments 122 and 123 he interprets as ironical, as well as the deities mentioned in 128, where the Golden Age is described as free from the sway of the traditional gods. In all these instances the satirical element is extremely gentle, if present, while delight in the imaginative picture involved seems to be the dominant feeling in the poet's mind. The mythopoeic instinct is strong in him, and

[1] Gomperz, p. 186, calls attention to the fact that these three are the three representative states of matter: solid, liquid, and gaseous. He also points out (note to p. 186) the interesting fact that these four elements are found in the "Volk-Physik" not only of the Greeks, but of the early Hindoos. This makes against Windelband's view, p. 48, that the four elements were arrived at by a synthesis of preceding theories.

[2] Burnet, p. 244.

[3] Fr. 21.

[4] In Aristotle we find for the first time a genuine metaphysic of the four elements. A priori grounds are adduced for them, and detailed proof that there must be four and only four.

[5] *Met.*, A, 4, 985 *a*, 33.

extends much farther than the conscious elaboration of mythical imagery. Conscious personification has its part to play, but the instinct toward conceiving things in personal terms is so fundamental a part of the poet's mental constitution, that it pervades his whole thought, and, as already remarked, it was without doubt often wholly unconscious. It is often impossible to say how far his real conception is bound up with this tendency of his imagination, but it cannot be too strongly emphasized that moderns, accustomed to the careful differentiation of figure from fact, are inclined to conceive his world as too mechanical and too colorless. When he speaks of the Sphaeros as "rejoicing in the solitude that encircles him,"[1] we may not assume it to be only a bit of poetic phrasing, especially since all things have, with him, a measure of conscious life. Love and Strife, though not personified in the sense of being conceived as capricious or arbitrary deities, have yet to his thought an ethical and emotional color connected with their activities.[2] They are a step in the development of the modern notion of force, but only a step.

ELEMENTS IN COMBINATION

The most important problem of this part of our subject, is the determining of the precise notion Empedocles had of the elements, and the way in which he conceived it possible by mingling them, to produce the endless variety of substances in the world. The two questions are inseparable. Aristotle evidently interpreted the four elements of Empedocles as inert unchangeable substances, with certain definite sense-qualities. Their mixture was to be thought of as mechanical mixture, "like the bricks in a wall." They were moved from without by external agencies, Love and Strife.[3] Most modern discussions explicitly or implicitly accept this interpretation.[4]

The evidence at hand seems to prove, however, (*a*) that Empedocles is, as Gomperz puts it, as much a hylozoist as the Ionians; (*b*) that Love and

[1] Fr. 28.

[2] Cf. Fr. 17, 19; Fr. 22, 6 to 10; Fr. 35, 13.

[3] Cf. Arist., *De Gen. et Corr.*, B 6, 333 *b*, 22 ff.; B 7, 334 *a*, 27.

[4] Gomperz dissents from the view that the elements are inert. Burnet and Tannery ascribe to them a tendency to move toward their like, which is an important modification. Zeller, 770, believes that he adopted Parmenides' concept of inert matter. Windelband takes the same position. The latter essays a definition of the term element as employed by Empedocles, not a single phrase of which can be in strictness correct. It is a concept "des in sich gleichartigen, qualitativ unveränderlichen und nur wechselnden Bewegungszuständen u. mechanischen Theilungen zugänglichen Stoffs," p. 47.

Strife were not conceived by him as universal "motor causes," but as having the specialized function of effecting and dissolving certain combinations of the elements; (*c*) that the notion of mixture was not defined by him, but was conceived with the vague indefiniteness of popular thought.

There is always a tendency to interpret early thought in terms of later, and it is hard to realize how late the conception of matter as inert, lifeless "stuff," made its appearance. Modern criticism has come to recognize that Love and Strife are not conceived by Empedocles in purely immaterial terms.[1] It has been slower to see the inevitable corollary that matter is not divested, in his thought, of motion and intelligence.[2] Yet we are told in Empedocles' own words that "everything has understanding and a share of thought."[3] Consciousness in its higher forms is simply a more perfect mixture of the elements; "for it is by earth that we see earth, and by water, water."[4] Motor attributes, quite as clearly as intelligence, were ascribed to the elements. Aristotle was greatly troubled by the fact that they were spoken of as moving hither and thither with no explicit mention of Love and Strife, which he regards as Empedocles' only motor causes.[5]

Fire performs an especially active function; to it Love hands over her combinations that they may be hardened; the moon and the outer vault of the heaven are crystallized by its agency; its motion lies at the root of the revolution of the heavens; the growth of plants upward is due to its upward tendency; the "whole-natured forms," whose genesis precedes the genesis of men and women, are pushed up by fire, "desiring to reach its like;" death is due to the departure of fire from the body.[6] Instances of this sort are so numerous as to preclude the possibility of regarding them as oversights in the system. The elements themselves are clearly to be thought of as endowed with motor attributes.

When we attempt to gain a clear notion of the function of Love and Strife in the processes of the world, the facts just noticed demand further consideration. Clearly, if so much be explained by means of the activities of the elements, it is impossible to regard Love and Strife as the motor

[1] Cf. Zeller, 770; Burnet, p. 245; Tannery, p. 304.

[2] This is clearly recognized by Gomperz, but not by other historians of philosophy.

[3] Fr. 110, 10.

[4] Fr. 109. Aristotle's suggestion, *De An.*, A 2, 404 *b*, 12, that each of the elements is a soul, seems to be but an inference from this fragment. Cf. Zeller, 769, n. 1.

[5] *Phys.*, B, 4, 196 *a*, 17.

[6] On these points cf. Fr. 73; Aet., ii, 25, 15; ii, 11, 2; Plut., *Strom.* 10; Arist., *De An.*, B 4, 415, *b*, 28; cf. Aet., v, 26, 4; Fr. 62; Aet., v, 24, 2.

forces of the world in the universal and consistent way that we have hitherto been inclined to suppose. Is there any attempt to differentiate and clearly define their function? Observing the frequent employment of the attraction of like for like as an operative principle in explaining phenomena, recent critics, Tannery,[1] Burnet,[2] and Gomperz,[3] have attempted to give it a definitely articulated place in the system, and to relate its operation to that of Love and Strife. This attraction they regard as a principle inherent in matter, a part of its very nature. The function of Love is to bring unlike things together. Strife, by breaking up the unions she effects, gives free play to the natural tendency of like to seek like. Thus without conflict or inconsistency, a place is given for all three bases of the explanation of motion. Attractive as is this theory, there are important considerations against it. First, the fact that the principle is not universal in its scope. Aristotle tells us that mention is found in Empedocles of many movements in nature with which Love and Strife had nothing to do. A large number of these instances cited by him and by others cannot be explained by the attraction of like for like. For example, the motion of fire upward is, according to Aristotle, sometimes treated as "natural;"[4] weight is invoked as a means of explaining the distribution of the elements in the first separation from the Sphere, and of explaining the revolution of the heavens;[5] the hardening and evaporating power of fire must also be noted;[6] capricious or chance motion seems to have its place also,[7] chance being employed, as in popular thought, uncritically, and without analysis of its meaning.[8] A

[1] P. 309.

[2] P. 246.

[3] P. 192 (§ 4).

[4] Arist., *De. Gen. et Corr.*, B 6, 334 *a*, 4.

[5] Philo, *De Prov.*, ii, 60 p. 86. That Empedocles "gave no account of heavy and light," Arist., *De Caelo*, Δ 2, 309 *a*, 19, has no significance here, any more than it is valid ground for rejecting, with Burnet and Diels, Stein's *Vs.* 143.

[6] Philo, *ibid.*

[7] Arist., *Phys.*, B 4, 196 *a*, 19; *De Gen. et. Corr.*, B 6, 334 *a*, 1; 333 *b*, 10; cf. Fr. 53; *Phys.*, B 8, 198 *b*, 29.

[8] The same may be said of Empedocles' use of the term "necessity" which comes, however, in the vagaries of late criticism to have a variety of curious interpretations. It figures as a motor cause, Simpl., *Phys.*, 465, 12; as a material cause, Them., *In Phys.* 59, 9; it is a higher "substance" which makes use of both Love and Strife, and of the elements, Aet., i, 26, 1; Plut., *De An. Procr.* 1026 B; it figures as a monad to which Love and Strife are reduced, they in turn in some sense embracing the elements, Simpl., *Phys.*, 197, 10; cf. Zeller, 777, 1. These vagaries seem to have grown chiefly out of Arist., *Phys.*, Θ 1, 252 *a*, 5 rather than out of Fr. 115, 1, as Zeller supposes, though the latter passage doubtless has had its influence.

further objection to this definition of the attraction of like for like in relation to the system, is the absolute ignorance of ancient writers, particularly of Aristotle, of any such definition. It is unquestionably true that the tendency of like to seek like is treated as a valid principle by Empedocles in a large number of instances.[1] It seems probable, however, that its validity was taken for granted, and that no attempt was made to define the limits of its operation, or to correlate it with other forces. The idea has sufficient hold upon the popular mind at all times to occasion such an assumption,[2] and preceding Greek philosophy seems to have strengthened that hold.

Aristotle's discussion of Empedocles in common with Anaxagoras, with reference to the use made by them of their supposed "motor causes," can be best understood on this hypothesis. He says; "they made almost no use of these [motor causes] except to a slight extent. . . . . Empedocles makes more use of them than [Anaxagoras] but a far from adequate use."[3] There is a clearly recognizable and easily calculable bias in all of Aristotle's reasonings in such matters. His desire to find in his predecessors anticipation of his own doctrines, would lead him to seek in the doctrine of the attraction of like for like, recognition of the principle of natural motion of the elements, were anything like a universal scope assigned to its operation.[4] The same bias, we believe, has led him to attribute to Love and Strife as motor forces, a far larger scope than Empedocles intended, censuring as mere lapses the many exceptions to their operation.[5] Subsequent writers, ancient and modern, have followed him upon this point, instead of seeking light in Empedocles' own fragments. We have several instances where their function is referred to in general terms by Empedocles,[6] and in no one of them is any suggestion found of universal motor activity, but only mingling and separation of what has been mingled.[7]

[1] It should be noted that in one instance exactly the opposite principle, the attraction of unlikes, is invoked. Animals with most heat are said to seek the water, avoiding the excessive heat. Arist., *De Resp.*, 14, 477 *a*, 32; Theophr., *De Caus. Plant.*, i, 21, 5 (yet note Aet., v, 19, 5).

As instances of the employment of the principle note Fr. 90; Fr. 110, 9; Fr. 62, 6.

[2] Arist. *Eud.*, *Eth.*, H 1, 1235 *a*, 9; Plato, *Lys.*, 214 B.

[3] *Met.* A 4, 985 *a*, 17.

[4] In the *Physics* he deplores the absence of such a principle in Empedocles.

[5] The difficulties into which Aristotle is led by the attempt to carry out this interpretation are very great. In one passage he gives vent to quite a remarkable outburst of impatience of Empedocles' indefiniteness: *ἴδοι οὖν ἢ διορίσασθαι ἢ ὑποθέσθαι ἢ ἀποδεῖξαι, ἢ ἀκριβῶς ἢ μαλακῶς ἢ ἀμῶς γέ πως*, *De Gen. et Corr.*, B 6, 333 *b*, 24.

[6] Fr. 17, 7; Fr. 20; Fr. 21, 7; Fr. 22.

[7] We cannot, unfortunately, ignore their context sufficiently to see support for this

The primary idea suggested by these passages seems to be the fusing and transforming process which the elements undergo in combination, under certain conditions. If this be true, it would apply chiefly but not exclusively to organic combinations. We can hardly doubt that the idea of Love and Strife was formulated primarily as a result of the study of organic processes. We have no instance where their operation is mentioned save in the formation and dissolution of organic substances, and of the Sphaeros, which is really also an organic substance. The term "made like" so often used of the operation of Love is intended as a description of this transforming agency. Of a "motor cause" *per se* Empedocles felt the need as little as Anaximander. He was quite content to explain many forms of spatia motion on the lines his predecessors had followed,[1] and in the main outlines of the formation of the world, as well as many other classes of phenomena, the substitution of four elements for one met sufficiently for his purposes the Eleatic criticism of qualitative change as employed in early systems. In the realm of organic life something more seemed to be needed. The constituent substances were so obviously transformed, and did not manifest at all the qualities of their constituents. Love and Strife were invoked as a means of effecting these combinations and dissolving them. That their operation was confined to organic combinations is not probable,[2] but organic combinations furnish the most obvious examples of the power of Love to make "one out of many."[3]

position, as does Gomperz, in the words of Aristotle, *De Gen. et Corr.*, B 6, 334 *a*, 8: ἀλλά τινος κινήσεως ταῦτα αἴτια. Gomperz, note to p. 197.

[1] There is no intention of denying that Love or Strife may sometimes cause spatial motion. The poet surely made no technical limitation or definition of their function But the primary root and meaning of his conception seems to be the one here stated.

[2] No sharp line was drawn between organic and inorganic by Empedocles.

[3] The corrupt fragment 93 probably gave an instance of affinity in mixture. A few points may be noted regarding the text. The MSS read: βύσσῳ δὲ γλαυκῆς κρόκου καταμίσγεται [ἀκτίς]. Of the many emendations, Karsten's is the best. β. δ. γλαυκῇ κόκκου κ. ἄνθος. Diels supposes that βύσσος is a color instead of a kind of cloth, as is usually held. He reads β. δ. γλαυκῆς κόκκος κ. ἀκτῆς, "mit der Byssosfarbe aber wird die Beere des blauen Holunders gemischt." Against this interpretation the following considerations may be urged:

1. Mixing of colors would not be an apt illustration of Plutarch's thought.

2. Plutarch would hardly use κόκκος alone, as he does, for the kermesberry or its dye, if he intended to quote immediately a line of Empedocles containing the word with ἀκτῆς meaning elderberry.

3. The union formed between the dye and the cloth would be a more apt illustration of the affinity of certain substances than would the mixing of colors. Cf. Lucr., vi, 1073, for a similar illustration and Plato, *Rep.*, 429 D.

Plutarch, we may suggest, is not giving an additional instance of kindred sub-

MIXTURE

It is quite clear that no analysis was made of the notion of mixture as here employed. Aristotle, as we have noticed, criticizes the theory on the supposition that mechanical mixture is meant. But the use of such phrases concerning the elements as, "being made one," "coming together into one," "being born through Strife," "wasting away into one another," show a recognition of the fact that a real transformation takes place in the process of combination.[1] Indeed we find explicit mention of the great change wrought in the appearance of things by mixture.[2] On the other hand it is altogether a mistake to ascribe to him an anticipation of the notion of chemical mixture. Such a notion is impossible without a different conception of the elements. With Aristotle they must be regarded as changing, or be defined in terms other than sense qualities as in modern chemistry, or a distinction between primary and secondary qualities must be drawn as in ancient atomism,[3] before the term "chemical mixture" can have any meaning. We have not the slightest ground for supposing that Empedocles reached any clearer conception of mixture than that employed in the common language of his own day. He seems to have used the altogether undefined idea of ordinary experience. When he wishes to explain his position he does so, not by analysis or precise definition, but simply by an appeal to a familiar instance of mixture wherein his hearers can readily see the transformation of qualities that is effected.[4] To say that his philosophy contained the germ of the conception of chemical mixture, or of mechanical mixture, is just as true and just as false as to say the same of ordinary thought.[5] But it must be apparent that his theory would become untenable so soon as either conception of mixture was clearly thought out and adopted. For it would be impossible to think clearly of mixture as mere juxtaposition of particles, and still believe that four elements furnish qualities enough to

stances, but is supplementing the second instance given. We would keep Karsten's reading, retaining MSS ἀκτὶς in place of ἄνθος, a doubtful but not impossible metaphor, and translate, with the Plutarchean context, as follows: "Carbonate of soda, when mixed in, seems to draw the dye into the material 'and the brilliance of the scarlet dye is mingled thoroughly with the gray cloth,' as Empedocles says."

[1] For such phrases see Fr. 22, 5 and 9; Fr. 26, 2, 7 and 10.

[2] Fr. 21, 14.

[3] Fr. 21 cannot be regarded as a basis for supposing that this distinction was drawn by Empedocles, neither is there elsewhere conclusive evidence for it.

[4] Fr. 23.

[5] Zeller seems inclined to attribute to him the thought, if not the language, of mechanical mixture; cf. Zeller, p. 765, 3.

account for the infinite variety of nature. On the other hand, if we assume that mixture means something more, if we assume that a real transformation is effected by combination, it must immediately be seen that the qualities of the elements are not permanent. We must, to retain the permanency of the elements, either define them in terms other than sense qualities, or as a makeshift distinguish between primary and secondary qualities. Neither was done by Empedocles.[1] The apparent tenability of his position rests wholly upon the ill-defined and even shifting character of the concepts employed. He gets the advantages of both kinds of mixture without their difficulties.[2]

Aristotle recognizes the inconsistency of the notion of mechanical mixture, which he ascribes to Empedocles, with the "union into one." External as is his mode of reviewing the matter, it is nearer the truth than many modern discussions.[3]

In two fragments preserved to us[4] there is specific mention of the quantities of the various constituents employed in the formation, in the one case of bone, in the other of flesh and blood. The conclusion has been drawn that Empedocles anticipated the principle of proportional combination of modern chemistry.[5] But there is no evidence that the principle was generalized, and the fact that a little more or less is, in the case of flesh and blood, a matter of indifference, hardly gives room for such a generalization. Aristotle, indeed, censures his failure to universalize the principle.[6]

[1] It is altogether probable that he would have been wholly unprepared for the question in what the self-identity of the elements consists.

[2] Post-Aristotelian evidence, as we should expect, follows Aristotle in ascribing to Empedocles the notion of mechanical mixture. It is evident that this is a correct logical conclusion from one aspect of his thought. The important thing, however, is the fact that he himself did not draw the conclusion. Galen in *Hipp. de Nat. Hom.*, A 2 (Kühn, XV, 32) ascribes the conclusion to him. It is implied Aet., i, 17, 3; i, 13, 1, and elsewhere. Plato, *Laws*, x, 889 B ff., attributes to an indefinite "they," probably Sophists of his own day who advocated Empedoclean physics, a position more mechanical than Empedocles' own thought as here interpreted.

[3] *Gen. et Corr.*, A 1, 315 *a*, 5. It must be clear that in denying to Empedocles the idea of mechanical mixture we by no means ascribe to him the Aristotelian notion of qualitative change. Dr. Heidel has clearly shown that none of the pre-Socratics held this doctrine, *Archiv*, XIX, 333. But it seems hardly true that these two alternatives exhaust the possibilities, as Dr. Heidel maintains they do. The real question at issue is whether the popular notion of mixture, undefined as it is, would be likely to find a place in philosophic thought at this time.

[4] Fr. 96 and 98.

[5] Gomperz, p. 188.

[6] *Met.*, A 10, 993 *a*, 19.

The simple proportions suggested in both of these instances, as well as in the case of the sinews, an additional instance preserved to us by the Doxographers,[1] make it unlikely that the proportions used are thought of as constituting a complete basis of qualitative differences. The phrase employed by Aristotle in stating Empedocles' view, λόγος τῆς μίξεως, is probably responsible for the tendency of modern thinkers to attach undue significance to Empedocles' suggestions in this direction. But the phrase can hardly have been used by Empedocles, and Aristotle is keenly alive to the incompleteness of Empedocles' thought at this point. In the simple concrete way in which Empedocles employed the principle, it would be used by ordinary men as soon as any of the arts appear, and would naturally go with any pluralistic theory of the elements.

There is no evidence that everything was thought to contain all of the elements. This notion seems to have originated with Anaxagoras. The description of bone omits air, though Simplicius unjustifiably attempts to interpret the fragment so as to include it, and Theophrastus inadvertently assumes all four elements to be present.[2] The sinews, too, contain no air;[3] the heavens are said to be composed only of fire and air.[4] It has been urged that universal mixture is the only possible basis for interaction, since only like can act on like. But while likeness is the general basis of attraction and of perception with Empedocles, it is not a necessary condition of all forms of interaction. The hardening power of fire is an operation exerted upon other elements. Symmetry of pores, a condition of some forms of interaction, does not imply like constituents. Aristotle affirms that Democritus stood alone among early thinkers in making likeness the basis of interaction.[5] It is strange in the face of these facts that by so careful a student as Beare the law of perception should be made "a deduction from the metaphysical theory that 'like affects like.'"[6]

[1] Aet., v, 22, 1.

[2] Fr. 96; Simpl., *De An.*, 68, 5; Theophr., *De Sens.* 23; Aet., v 22, 1; Zeller, p. 762.

[3] Aet., *loc. cit.*

[4] Galen in *Hipp. Nat. Hom.*, A 2 (Kühn, XV, 32), does not imply the presence of each of the elements in everything, but simply explains what mixture means.

[5] Arist., *De Gen. et Corr.*, A 7, 323 *b*, 10.

[6] Beare, p. 98, interprets to this effect Theophrastus, *De Sens.*, 2: Ἐμπεδοκλῆς δὲ πειρᾶται καὶ ταύτας ἀνάγειν εἰς τὴν ὁμοιότητα. By supplying τὰς αἰσθήσεις with ταύτας instead of τὰς κατὰ μέρος αἰσθήσεις, the impression is given that Beare takes the passage to mean that the senses as well as other phenomena were explained on the principle of likeness; but the context shows the meaning to be that Empedocles did not content himself with the general proposition, "like perceives like," but discussed the special senses individually.

Aristotle's assertion that Empedocles reduces the four elements to two, opposing fire to the rest,[1] probably does not imply any departure from the doctrine that the elements were unchangeable. Empedocles seems to have ascribed to fire an especially active function, as already noted, and in his explanations of physical and biological phenomena, he seems often to follow the views of others without adequate correlation with his own fundamental doctrines.[2]

The theories just discussed, the theory of four elements, and of their combination in various ways to form phenomena, are Empedocles' attempt to solve the problem of qualitative change, and to meet the Eleatic criticism of early hylozoistic theories. He cannot be said to have met this criticism more than superficially. Keeping, as he does, the qualitative conception of element, and at the same time asserting the permanent identity of the elements amid their obvious transformations, he adopts a position very close to common sense, but lacking in philosophical thoroughness compared with contemporary and preceding thought. Its closeness to obvious aspects of experience, and its rough availability for the comprehension and organization of that experience, are evident. To these facts are due its long survival in common thought, though not in philosophy, and its partial formulation in "folk-physics" long before Empedocles.[3] Parmenides would have thrown experience overboard before philosophically accepting such a position. Anaxagoras or Leucippus would certainly, indeed did, accept views very paradoxical to common sense in preference.[4]

The suggestion is made by Tannery and Gomperz that Empedocles' experience in practical medicine helped to develop in him the notion that out of varying combinations of a few elements the infinite variety of things in the world could be produced. This seems not improbable and accords well with the view of the theory that has just been stated.[5]

LOVE AND STRIFE

In determining Empedocles' conception of the elements and of mixture, the function assigned Love and Strife has necessarily received some consideration. A few further points regarding the way in which they are

[1] *De Gen. et Corr.*, B 3, 330 *b*, 19; *Met.*, A 4, 985 *a*, 33.

[2] Cf., for example, p. 83.

[3] Cf. Gomperz, note to p. 186.

[4] The theory hardly seems to deserve the full measure of praise accorded it by Gomperz: "in seiner Stofflehre stehen wir mitten in modernen Chemie." The modern limitation of the number of the elements would not possess philosophic worth were it based on a definition of element in terms of immediate sense qualities.

[5] It seems quite clear that in his theory of vision, and of sensation in general, he was influenced by the physician Alcmaeon. Diels, *Emp. u. Gorg.*, *loc. cit.*; Theophr., *De Sensu*, §§ 25, 26.

conceived demand notice. We have remarked that material attributes are ascribed to them. It is not true, however, as asserted by Burnet and Tannery, that they are elements "just like the other four."[1] They are set apart as having unique functions, and they are not enumerated among the constituents of individual things such as flesh and bone, as are earth, air, fire, and water. It is less erroneous to conceive them as abstract forces than as mere elements, for their active functions are their important functions. They might possibly be described as notions of immaterial force in the process of making. It is not unlikely that in the poet's own thought their aspect changed somewhat, that in certain connections they were personalized, coming quite close to the deities of popular mythology,[2] that at other times they were conceived somewhat more abstractly.[3] Their fluctuations were not unlike those of the popular conceptions of Love and Strife as a part of daily life. For the names Love and Strife are not a play of fancy. They are two important elements of experience universalized. The poet himself tells us that Love is the same as she that is implanted in the human frame, who is the source of the kindly feeling of men toward one another.[4] It is possible to conceive that he is reducing the experiences of friendship and kindliness, with their opposites, to the level of mere mechanical attraction and repulsion, instead of conceiving the processes of all nature after the analogy of the conscious experiences to which he gives these names. But mechanical conceptions of nature were not yet familiar enough so that the poet, if he held them, would venture to employ figurative phraseology and expect to be understood. His conception must be an intermediate one, wherein the feat of abstraction was not yet fully accomplished. He himself, probably, could not have differentiated fact from fancy in his verses.[5]

Aristotle questioned, as have many since him, why two forces instead of one were put forward by Empedocles. The motive seems to be at bottom

[1] Tannery, p. 306, is more thoroughgoing in his interpretation than Burnet. He compares Love to the luminiferous ether of modern science, and holds that the pores of all things are filled with this subtle form of matter.

[2] Fr. 30; Fr. 35. It is impossible in these passages, to tell how much is conscious poetic imagery.

[3] So, perhaps, in Fr. 17, 7 and 8; Fr. 96, 4.

[4] Fr. 17, 22.

[5] It is probable that technical phraseology develops itself just so soon as precision of thought demands it. Empedocles would not have employed the poetic form had he felt the need of logical coherence and clear presentation that is often ascribed to him. For the poetic form is not the invariable tradition of philosophy, and Empedocles was the last Greek philosopher of importance who employed it.

the same as in the positing of several elements instead of one. It may be regarded as fundamental to Empedocles' thought, that from a unity diversity of result cannot come without some determining cause. A single principle the Eleatics made to appear as incapable of dealing with the changes in the world as with its qualitative variety. Attraction and repulsion, good and evil, are both facts demanding explanation, and require a twofold principle.[1]

THE WORLD-CYCLE

In the cosmic process as a whole, as well as in the individual phenomena of composition and dissolution, the doctrine of four elements united and separated through Love and Strife has its integral place. As already described, the world process is a cycle of change ever repeating itself. Love and Strife in alternation gain control over the world by a prolonged struggle. Love, during her period of mastery, unites all things into one, the Sphaeros; Strife separates them into the four elements. This alternation of control of Love and Strife lies in the fundamental nature of things. It is decreed by necessity, sworn by "broad oaths." Neither when Strife is in full control, nor when Love has the helm, is there an organic world, but only in the intervals when the two are contending for the mastery.[2] The wonderful imaginative picture of this process is clear enough in its main outlines, save in two important points. In what portion of the cycle are we living, and where does Empedocles begin his account of the building of the world?

Most modern writers have divided each cycle into four periods, the present world being intermediate between the separated elements and the Sphaeros.[3] Dümmler, and later Burnet, have urged that this world is rather the epoch immediately following the Sphaeros.[4] Tannery finds

[1] Aristotle in one passage treats Love and Strife as final causes. *Met.*, A 4, 984 *b*, 32. There is this degree of basis for his interpretation, that Love is always regarded as beneficent, Strife as baneful. This again is an additional reason for not regarding them as mechanical in their mode of operation.

[2] Simplicius *De Caelo*, 310, 13, tells us that the word κόσμος was used for the present world. His statement hardly gives warrant for Zeller's conclusion, 783, 1, that Empedocles made explicit distinction between κόσμος and σφαῖρος. κόσμος is used of the Sphaeros, Fr. 26, 5.

[3] So Zeller, Rohde, Windelband, and apparently Diels.

[4] Dümmler, *Akademika;* Burnet, p. 249. Somewhat later the same view was put forth independently by Döring, but without detailed defense, *Zeitschr. f. Phil.*, CV, 29. Wellman takes the same view, Pauly, *Realencyc.* But none of the advocates of this position have discussed the evidence at all fully.

no place for four periods.[1] An organic world cannot, he thinks, be formed when Strife is on the increase. Neither can his complete dominance be a period of rest. It must be characterized by turbulent movement. A similar view has recently been maintained by von Arnim.[2] The evidence at hand seems to vindicate the position of Dümmler and Burnet. Postponing for a moment the question of the place in the cycle of the present world, we may notice the evidence in favor of two periods of generation.

In Fragment 17 of Empedocles, a statement is found which, on its most obvious interpretation at least, suggests that there are two ways in which a world of mortal existences is generated, "There is a twofold genesis and a twofold destruction of mortal things." These words in isolation might be taken, as they repeatedly have been taken, to refer to the individual births and deaths occurring in the present world.[3] But the entire context supports the supposition that cycles of transformation of the world as a whole are referred to. Aristotle supports the view that a world is twice generated in each cycle. "Empedocles says that the world is in a similar condition now, in the period of Strife, to its former state in the period of Love."[4] Elsewhere two periods of motion are referred to with explicitness.[5] A significant allusion is found in Theophrastus which has been overlooked in this connection. As an objection to Empedocles' theory of sensation through effluences we are told that "it would follow therefrom that in the period of Love there could be no sensation at all, or less [than now] because then the process of bringing together is taking place and not that of dissipation."[6] The evidence of the Aristotelian commentators is, it must be

[1] Tannery, p. 308.

[2] The latter has considered the historical evidence more adequately, but his conviction seems to be based quite as much as that of Tannery on a priori grounds; *Festschr. f. Gomperz*, Wien 1902.

Other hypotheses that have been put forth are either too ill founded to make refutation necessary, or have been so successfully criticized by Zeller, that they may be passed over. To the latter class belongs Karsten's view that the cycle is not a time cycle, a view which deserves notice because it has the authority of the ancient neo-Platonic commentators upon Aristotle, notably Simplicius.

[3] This view is taken by von Arnim, Stein, Karsten and others. Cf. Zeller's criticism, p. 756, 2.

[4] *De Gen. et Corr.*, B 6, 334 *a*, 5. Von Arnim, p. 19, dwells upon the obscurity of this passage. I venture to believe that it seems obscure only because it is relentlessly explicit and will not lend itself to forced interpretation. The thought, though condensed, is clear. How, Aristotle asks, if Love and Strife are opposites, can the world now, in the period of Strife, be like the world of the preceding period of Love?

[5] See the passage quoted, p. 54.

[6] Theophr., *De Sens.*, § 20: *συμβαίνει δὲ καὶ ἐπὶ τῆς φιλίας ὅλως μὴ εἶναι αἴσθησιν*

admitted, decidedly against the view that an organic world is twice generated in each cycle. They speak always of but two periods, the world of Love and the world of Strife, the former being the Sphaeros, and the latter the present world.[1] Sometimes Love is regarded as alone the cause of the former, Strife of the latter, but Simplicius admits that both seem to have some efficacy in both periods.[2] There is in these writers, however, an evident attempt to translate Empedocles' cycle into terms of the neo-Platonic antithesis between the "sensible and intelligible world." The time form of presentation is attributed to a pedagogical motive analogous to the geometer's method of constructing the figure which he explains.[3] Little weight should therefore be given to their statements, over against the important testimony from Empedocles himself, and from Aristotle and Theophrastus.

Against this testimony is urged the difficulty of conceiving a world as generated through the power of Strife. "Toute combinaison nouvelle que pourrait former le hasard entre les éléments isolés serait nécessairement instable."[4] This argument would be valid were we to suppose that Love withdrew so soon as Strife commenced his work. But we have every reason to believe that the world is for centuries the battle-ground of their contention for the mastery. It might be valid, again, were we to conceive Love and Strife strictly as mechanical forces, operating according to law at all points in the world, the one with increasing, the other with decreasing force. In this case we should suppose that Love made no local and temporary advances during this period, but simply relinquished her hold gradually. But by Empedocles their relation was conceived rather after the analogy of the battlefield, wherein one point after another is lost for a considerable time to the enemy, and then regained, perhaps only to be lost again.[5] In this period every combination is, to be sure, ultimately unstable. But not more so than all life as viewed by many a Greek thinker besides Empedocles. Every organic combination is the work of Love,

ἢ ἧττον διὰ τὸ συγκρίνεσθαι τότε καὶ μὴ ἀπορρεῖν. The statement made *Dox.*, ii, 4, 8, E. [*φησι*] *τὸν κόσμον φθείρεσθαι κατὰ τὴν ἀντεπικράτειαν τοῦ νείκους καὶ τῆς φιλίας*, favors two worlds. Sturz adds *γίνεσθαι καὶ* before *φθείρεσθαι*, an improbable emendation, since the other views mentioned in the immediate contest consider only the destruction and not the generation of the world.

[1] Simpl., *Phys.*, 31, 18 ff., 31 ff.; *De Caelo*, 528, 29; 294, 10.

[2] Simpl., *De Caelo*, 528, 29; *Phys.*, 31, 32, and 18.

[3] Simpl., *De Caelo*, 305, 20; cf. 304, 3; *Phys.*, 34, 8; *De Caelo*, 530, 16 and 24.

[4] Tannery, p. 308,

[5] Cf. Fr. 59, 1; Arist., *Gen. et Corr.*, A 1, 315 *a*, 16.

though death and dissolution through Strife are its inevitable destiny. In a period of contention that lasts no doubt for thousands of years, we could hardly expect to be able to see at a given moment in either world, which of the two forces was gaining the upper hand. Even if Strife increased at a given time, it might be but a local and temporary encroachment. Viewed in this way, we might quite well have a world similar in many features to the present one, twice during each cycle, and need not attempt to force the two passages cited from their obvious and natural interpretation.

In which of these worlds are we living? There is no problem of Empedocles' philosophy in reference to which greater confusion has prevailed than this. Aristotle certainly thought that the present world was the period of Strife, that is, the period beginning with the Sphaeros and ending with the separated elements. We have quoted his remark that the world according to Empedocles is in a similar state now in the period of Strife to its former state in the period of Love. ἅμα δὲ καὶ τὸν κόσμον ὁμοίως ἔχειν φησὶν ἐπί τε τοῦ Νείκους νῦν καὶ πρότερον ἐπὶ τῆς φιλίας,[1] A second passage reads, "it is not reasonable that the world should originate from elements that are separated and in motion. For this reason Empedocles omits to describe the generation of the world in the period of Love." διὸ καὶ Ε. παραλείπει τὴν ἐπὶ τῆς φιλότητος γένεσιν.[2] Since Empedocles could hardly have omitted an account of the present world, we must be living in the period of Strife.

Theophrastus' evidence is quite as explicit as that of Aristotle. The world ἐπὶ τῆς φιλίας is opposed to the present world.[3]

The neo-Platonic commentators on Aristotle, while they transmit no evidence in favor of a mortal world being twice generated in each cycle, give some slight indications that the present is the world wherein Strife is gaining ground. This evidence is but indirect. It is evident that no weight can be attached to their repeated reference to this as the world of Strife, for that means with them only that it is not the Sphaeros.[4] But they preserve suggestions from Aristotle and from Empedocles' poem, that this or that phenomenon belongs to a time when Strife is just beginning to separate the Sphaeros, or, on the other hand, belongs to the stage when Love is

[1] Arist., *De Gen. et Corr.*, B 6, 334 *a*, 5.

[2] *De Caelo*, Γ 2, 301 *a*, 14. The phrase, "in motion," has reference to the view of Anaxagoras just considered by Aristotle.

[3] *De Sens.*, 20, quoted above.

[4] Simpl., *De Caelo*, 293, 20; 528, 11. The order of treatment of Empedocles seems here to be observed. Everything is gathered into the Sphaeros, then separated out again. Cf. also Simpl., *De Caelo*, 590, 19.

gaining ground. Usually these remarks add little to the direct testimony of Aristotle, but they are in the main consistent with it. Often almost inextricable confusion is introduced into the problems discussed by the attempt to reconcile Empedocles' verses and Aristotle's notices with their conception of a single world of generation. The evidence of Philoponus, for example, seems at first sight to be in favor of attributing the generation of animals out of separate members to the period of Strife, since he describes the separate members as being produced *ἐν τῇ πρώτῃ διακρίσει τοῦ Σφαίρου*. But we find that the putting together of the members is ascribed to a time after everything had been separated, *πάντων διακριθέντων*. These statements are not inconsistent. The world has advanced farther when the members are put together than when they were created.[1] The separation of all things, to Philoponus' thought, does not mean the complete parting of the elements, but the integrating of a world. These separate parts of animals were mingled in the Sphaeros, and are now separated out. *ὡς δὴ μὴ μόνον τῶν στοιχείων ἐν ἀλλήλοις μεμιγμένων ἐν τῷ Σφαίρῳ ἀλλὰ καὶ τῶν μορίων τῶν ζῴων*.

Simplicius makes a more serious attempt than Philoponus to reconcile Aristotle and Empedocles with his preconceived notions. He recognizes that the separate members were created when Love was beginning to get the upper hand, *κατὰ τὴν τῆς φιλίας ἀρχήν*. He sees too that the phrase *ἐπὶ τῆς φιλότητος* includes not only the time when Love is in control, but the period leading up to it. *ἐπὶ τῆς φιλότητος . . . . οὐκ ὡς ἐπικρατούσης ἤδη τῆς φιλίας, ἀλλ' ὡς μελλούσης ἐπικρατεῖν*.[2] Yet he also uses the expression "the world of Strife" to include all organic creation and his view is in general subject to the neo-Platonic limitations. He is in the greatest difficulty in the attempt to interpret the passages of Aristotle, wherein Empedocles is said to have omitted to describe the generation of a world in the period of Love. The statement is referred to the Sphaeros and is explained by supplying *διάθεσιν τῶν στοιχείων* instead of *γένεσιν* in the sentence *διὸ καὶ* E. *παραλείπει τὴν ἐπὶ τῆς φιλότητος ⟨διάθεσιν τῶν στοιχείων⟩*.[3] Equally great are the difficulties of Alexander in the interpretation of the statement that the world is in a similar condition now in the period of Strife to its former state in the period of Love.[4] As a final

[1] Philop., *Phys.*, 314, 8; Zeller, 793, 3, rejects Philoponus' evidence on the score of inconsistency.

[2] Simpl., *De Caelo*, 587, 24. With him as with Philoponus the isolated members are the work of Strife, not of Love, contrary to the view of Alexander. Cf. 586, 25, 587, 18.

[3] Simpl., *De Caelo*, 590, 24.

[4] Ap. Philop., *De Gen. et Corr.*, 268, 1. Philoponus himself simply takes the pas-

possible interpretation he suggests. ἢ ὁμοίως, φησί, κόσμος κατ' αὐτόν ἐστι καὶ κινεῖται ἐπί τε τοῦ νείκους νῦν καὶ ἐπὶ τῆς φιλίας πρότερον, ἐν δὲ τοῖς μεταξὺ διαλείμμασι τῶν ὑπ' ἐκείνων γινομένων κινήσεων, πρότερον τε ὅτε ἐκ τοῦ νείκους ἐπεκράτησεν ἡ φιλία καὶ νῦν ὅτε ἐκ τῆς φιλίας τὸ νεῖκος, κόσμος ἐστὶν ἄλλην τινὰ κινούμενος κίνησιν καὶ οὐχ ἃς ἡ φιλία καὶ τὸ νεῖκος κινοῦσιν. Here, curiously enough, there is recognized the possibility of supposing two worlds in the intervals between the "period of Love" and the "period of Strife," but neither of these can be the present world. The present world is still the neo-Platonic world in direct antithesis to the Sphaeros, while the intervening worlds are conceived as under some other force in place of Love and Strife.[1] The evidence of Aristotle, Theophrastus, and the neo-Platonists, must be regarded, therefore, as on the whole favorable to the view that the present is the period of Strife. Many of Empedocles' own doctrines as gathered from his verses or from later writers, lead directly to the same conclusion. We may notice particularly the following points: (*a*) The accounts of the formation of the heavens describe the separation of the large masses of air, water, etc., out of a mixture, described in one passage as "the first mixture of the elements."[2] (*b*) The generation of men and women as described in Fragment 62, from primitive forms with undifferentiated members, naturally fits into an era of advancing Strife. Articulation or differentiation of organs is a natural result of his increasing power.[3] That these primitive forms are sent up by the separating of fire, which desires to reach its like, is significant in this connection.[4] The formation of animals from members produced in isolation and afterward united naturally fits in, on the other hand, with the period of Love, and is by ancient writers uniformly referred to that epoch. The fact that later writers in referring to the formation of animals from isolated members, repeatedly state that they belonged to the period of Love, whereas in the numerous details regarding phenomena certainly

sage as does Zeller. Cf. p. 50. Alexander rightly rejects this interpretation on the ground that the criticism of Aristotle is thereby made pointless.

[1] Similar difficulties and forced interpretations arise in the attempt to explain Aristotle's reference, *De Caelo*, B 13, 295 *a*, 29, to a time when the elements were completely separated (Simpl., 528, 1). Simplicius finally concludes that Aristotle has been misled by Empedocles' mythical form of presentation, Simpl., 530, 16.

[2] Plut., *Strom.*, 10; Philo., *De Prov.*, ii, 60; Aet. ii, 6, 3.

[3] Note that Simplicius in commenting upon the word *οὐλοφυές* uses the phrase *μήπω γενομένης ἐν αὐτῷ διακρίσεως*. It might be urged that greater differentiation implies more organic union and a greater exercise of the functions of *φιλία*. This is true, but not on its more obvious side, the side which underlies Empedocles' thought in this connection.

[4] Cf. on this point Dümmler, *Ak.*, 217 ff.

belonging to our world, the period is never specified, is a slight additional indication that the period of Love is not the present period. (*c*) Trees, which are the first living beings to be formed in the present world, are described as having an exceptionally symmetrical mingling of the elements.[1] (*d*) There are indications that the present world is looked upon as a degenerating rather than an advancing world. That this is the temper of the *Purifications* is universally admitted. To those who do not admit any inference from the religious to the physical teaching of Empedocles,[2] we may mention the remark that the men of today are infants compared with those of the past. The suggestion of Fragment 78 that there was a time when a more perfect mixture of the air furnished better conditions for the growth of plants, may possibly have some force in the same direction.

In spite of this accumulation of evidence nearly all writers have supposed the present to be the world of Love. In this they have usually followed Zeller, who evades the consequences of Aristotle's testimony. To the phrase ἐπὶ τῆς φιλίας (or φιλότητος), in Aristotle, he gives three distinct meanings. (*a*) In the first of the two passages cited above, concerning the resemblance of the present world to the former world in the period of Love, he interprets the phrase ἐπὶ τῆς φιλίας as referring to the Sphaeros. The context in Aristotle shows it to be, however, the period leading up to the Sphaeros. The point of Aristotle's criticism is that the function of Empedocles' "motor causes" are not clearly differentiated, for if they were, the worlds under opposing forces could not be treated as similar. (*b*) Several times the phrase is by him taken in its rightful meaning as the period leading up to the Sphaeros. The second of the passages quoted above, to the effect that Empedocles omitted the account of the period of Love, is once correctly interpreted in accordance with this usage. Its meaning he explains in these words: "womit gemeint sein wird dass er diejenige Weltbildung zu der die φιλία den ersten Anstoss gab, und die mit der vollkommenen Vereinigung der Elemente im Sphaeros endete, nicht dargestellt hatte."[3] (*c*) Elsewhere this same statement of Aristotle is cited as an instance of the use of the phrase with reference to the period of advancing Strife, "die der gegenwärtigen gegenüberstehende Weltperiode," and the passage is cited

[1] Aet., v, 26, 4; Pseudo-Arist., *De Plant.*, A 2, 817 *b*, 35, we are told, τὰ φυτὰ ἔχουσι γένεσιν ἐν κόσμῳ ἡλλαττωμένῳ καὶ οὐ τελείῳ κατὰ τὴν συμπλήρωσιν αὐτοῦ, ταύτης δὲ συμπληρουμένης οὐ γεννᾶται ζῷον. The word ἡλλαττωμένῳ looks like confirmation of the view here taken. The rest of the sentence suggests more naturally the period of Love, but is not necessarily so interpreted.

[2] The definite connection of Cypris with the Golden Age is to the writer evidence that there is a real relation between the two doctrines.

[3] 783, 2.

as evidence of the exact reverse of its true implication. Aristotle is made to say that it is the period of Strife, which Empedocles omits.[1]

In his actual working out of the cycle in detail, Zeller always assumes that it is the period of Strife which is omitted. He begins his account of the generation of the world with the Sphaeros, it is true, but Strife separates the elements all at once, and a world is formed only in the process of re-uniting the elements again into the Sphaeros, that is, in the period of Love. In the main portion of his account the period of Love is uniformly treated as the present world, and all of the fragments and notices are said to have reference to it.[2]

Not only in regard to the implications of Aristotle's direct testimony does Zeller fall into confusion, but also in the attempt to interpret the fragments and notices as all referring to the period of Love. Many of them must be forced from their natural meaning to make them accord with that hypothesis. In particular is this true of the accounts which describe the formation of the heavens out of a mixture. To explain this Zeller assumes, with no historical evidence, that before an organic world is created the separated elements are stirred up into a confused mass by a whirling motion caused by Love. This mass he describes as "[der] Wirbel in dem die getrennten Elemente durch die Liebe zusammengerüttelt wurden."[3] This whirling motion he identifies with the δίνη mentioned in Fragment 35. It has no connection with the present revolution of the heavens, also, as Aristotle says, called by the name δίνη, which Zeller in accord with ancient testimony is compelled to ascribe to a different cause.[4]

The two forms of generation of animals, to which reference has been made, must by Zeller be assumed to belong to one period. There can, however, be no real relation between the two modes of formation.[5]

The only argument of importance which can be urged in Zeller's favor is that Fragment 35 of Empedocles' poem, one of the longest and most

[1] 793, 3 contains the quoted statement; 786, 2 and 4 the conclusion regarding the omission of the period of Strife.

[2] Writers seem not to have observed Zeller's confusion. Even Tannery, who dissents from Zeller very materially in his general conception of the cycle, follows him here, Tannery, p. 308.

[3] The passages wherein the world is described as generated from a mixture are cited, p. 49, 2. Plutarch uses the phrase ἐκ πρώτης τῆς τῶν στοιχείων κράσεως, which is difficult to interpret in accordance with Zeller's theory.

[4] This cause is the overweight of fire, Plut., *Strom.*, 10. The phrase διέκρινε γὰρ τὸ Νεῖκος, used by Aristotle (*De Gen. et Corr.*, B 6, 334, *a*, 1), of the process of "Weltbildung" shows again that he regarded it as the period of Strife.

[5] On this point cf. further p. 57.

important fragments that we possess, undoubtedly deals with the period supposed to be omitted, the period of Love.[1]

But this is not in necessary contradiction with Aristotle. He tells us only that no account of the genesis of the world in the period of Love was given. By this he probably means no description of the formation of the heavens and earth, the "Weltbildung" in its larger outlines. Fragment 35 probably is a stop-gap where such an account would be expected and furnishes a fitting introduction to the description of some of the detailed phenomena of that world.[2] To the period of Love, we conclude, are to be referred Fragment 35, and all of the descriptions of the formation of animals out of separate members, with the monstrosities incident to that process. To the period of Strife belong Fragment 62, and practically all of the other notices we possess of details of the formation of the world, and of meteorological, physical, and biological phenomena.

The view here adopted is, as already noticed, essentially the position of Dümmler and Burnet. Gomperz professes to follow Dümmler[3] but his detailed treatment presents serious difficulties. The accounts of the formation of the heavens and earth, the sun, stars, sea, etc., are all described by him correctly as belonging to the period of Strife.[4] He rightly refers the formation of men and women out of undifferentiated forms to that period. All of the other fragments concerning organic life seem to be referred to the period of Love. This clearly cannot be the case if the present is the period of Strife.

The accounts of Empedocles' philosophy usually take the Sphere as the

[1] A brief statement of Epiph., *Adv. Haer.*, iii, 19 (*Dox.*, 591) suggests that the present is the period of Love: κεχώρισται γὰρ, φησί, τὸ πρότερον, νῦν δὲ συνήνωται, ὡς λέγει, φιλωθέντα ἀλλήλοις. This sentence, however, is not entirely unequivocal, and if it were, it would have little weight compared with the facts on the other side.

[2] Fr. 35 is evidently the resumption of a theme already touched upon, and possibly follows a digression upon some minor subject. Zeller takes it to be the account of the first stages in the formation of the world of Love, in his view the present world. It is, however, in essential contradiction with the other accounts of the formation of the present world, which, as is elsewhere noted, derive it from a mixture and not from the separated elements.

The somewhat numerous references to this passage by ancient writers, may be due to the fact that here Empedocles defines with some explicitness the respective agency of Love and Strife in their relation to a period in the world cycle, whereas in the cosmology proper much attention is given to secondary causes. Cf. Arist., *Met.*, A 4, 985 *a*, 21; *Gen. et Corr.*, B 6, 333 *b*, 33, where Empedocles is criticized for neglecting Love and Strife in his cosmology.

[3] Cf. Gomperz, note to p. 196.

[4] Pp. 194 ff.

logical starting-point of the cycle, whatever be their view as to the present period.[1] There are reasons for supposing that the separated elements were Empedocles' own starting-point. His insistence upon the primitive character of the four elements, upon the fact that all else is derived from them, makes it natural that he should begin his description of the cycle with them. The brief statements of the poem referring to the world transformations suggest this order of treatment.[2] Aristotle speaks of the elements as "by nature prior to the god" or Sphaeros.[3] A strong witness for it is also found in Aetius' account of the four forms of animal generation.[4] The passage will be discussed later, but we may notice here that the first two forms of generation mentioned, and specified as the first two, belong without question to the period of Love. This period would naturally, then, have been first treated in Empedocles' poem. Burnet and others who have hitherto dissented from the view that the four forms of animal generation all belong to the present world, have been forced to reject Aetius' indication of the order in which these different forms made their appearance.

Whether there be a period of rest under the sway of Strife requires some special consideration. The fragments contain no hints that bear upon the question. If the foregoing discussion be correct, there must be at least a point of complete separation between the two cosmic periods.[5] The symmetry of the system would seem to suggest that this be more than a point. Aristotle implies that equal times were assigned to the domination of Love and Strife,[6] which would require a prolonged interval under the sole sway of Strife, unless we are to suppose a longer struggle in the period when he is in the ascendency. The chief objection that has been brought to such a period of rest is the a priori one, that it is incompatible with the notion of the domination of Strife. The wildest confusion, it is urged, should signalize his mastery. This objection is not without force, yet it is quite clear that Aristotle thought of such a period as intervening. We

[1] Cf. Zeller, .780; Burnet, 245.

[2] Cf. Fr. 26; Fr. 17, 16, and 1; Fr. 21. Brief incidental statements of this sort are a significant indication of the way the matter lies in the writer's mind. Cf. Zeller, 813, 5, where it is acknowledged that the Sphere is always by Empedocles thought of as derived. The implications of this fact, however, are not regarded by Zeller.

[3] *De Gen. et Corr.*, B 6, 333 *b* 21.

[4] Quoted on p. 57.

[5] It is not possible to cite lines in which this is explicitly stated, though the poem is not without evidence on the point. Cf. Fr. 35, 14, where the phrase τὰ πρὶν μάθον ἀθάνατ' εἶναι, a figurative expression though it be, suggests, in contrast to the following line, this idea.

[6] *Phys.*, Θ 1, 252 *a*, 31.

have the oft-quoted passage of the *Physics* whose evidence is unequivocal: "As Empedocles says, it is in turn in motion and at rest, in motion when Love makes one out of many or Strife many out of one, and at rest in the intervals."[1] Further evidence of Aristotle's opinion can be found in his criticism of Empedocles' view that the earth is kept in its place by the revolution of the heavens. He asks how this stability can be explained at the time when the elements are separated by Strife: "For he surely cannot then appeal to the revolution [of the heavens] as an explanation."[2] Plutarch, on the contrary speaks of the elements, when entirely separated by Strife, as in motion, their movements being erratic and unruly.[3] Under ordinary circumstances Plutarch's evidence would have little force against that of Aristotle, but in this instance the weight of Aristotle's testimony is lessened by the fact that in the former passage, he cites as authority for his statement lines of Empedocles that cannot possibly have the interpretation he gives them, and which have nothing to do with the question in hand. It is not impossible that Empedocles himself left the matter ambiguous. If the hypothesis given regarding the outline of his treatment be correct, no necessity would arise for definition upon this point. Save in the brief initial summary there would be no occasion for an account of the transition from the end of the period of Strife to the beginning of the period of Love. Here he may have contented himself with some such statement as that "Strife now had won complete sway and separated the elements. Love re-entered and he withdrew to the depths of the world." This outline of his treatment is given as merely a possible method of dealing with his theme. In the present state of our knowledge we should leave the question open. The evidence is insufficient to decide it with certainty.

Although the cycle of the world's transformation may be analyzed into four distinct moments as is done by Zeller, Burnet, and others, it is better to think of it in terms of two, as was done by all the ancient thinkers,

[1] Arist., *Phys.*, θ 1, 250 *b*, 26; also 252 *a*, 5–10 which is to the same effect, though it is not so explicit, and throws no independent light upon the question. The fact that the singular is used in the latter passage in the phrase τὸν μεταξὺ χρόνον is not, as has been thought by von Arnim, significant. In the context "in the interval" would naturally mean "each interval," since their sway is spoken of as "alternate," ἐν μέρει. Simplicius interprets the period of rest referred to by Aristotle as the Sphaeros alone, but his is not a testimony which has weight on this point for reasons stated on p. 47 f.

[2] *De Caelo*, B 13, 295 *a*, 30: ὅτε γὰρ τὰ στοιχεῖα διειστήκει χωρὶς ὑπὸ τοῦ Νείκους, τίς αἰτία τῇ γῇ τῆς μονῆς ἦν; οὐ γὰρ δὴ καὶ τότε αἰτιάσεται τὴν δίνην. *Met.*, A 4, 985 *a*, 25 contains the same implication.

[3] Plut., *De Fac. in Orbe Lun.*, 926 F: [αἱ ἀρχαὶ] φεύγουσαι καὶ ἀποστρεφόμεναι καὶ φερόμεναι φοραὶς ἰδίαις καὶ ἀόθέδεις, κ. τ. λ.

including Empedocles himself.[1] These two are the period of Love wherein Love wins by a prolonged struggle the mastery over Strife and holds it undisputed for a time, and the period of Strife, wherein the case is reversed. The discrepancy in phraseology between ancient and modern writers at this point, has produced an apparent inconsistency which has helped to give plausibility to the denial of a double genesis of mortal things.

The phrases used by Aristotle and later writers, ἐπὶ τῆς φιλότητος and ἐπὶ τοῦ Νείκους, were probably not used by Empedocles himself. Since he described his worlds in their time succession, no names would need to be given.

Some confusion is occasioned among neo-Platonic writers by their natural desire to identify the period of Love with the Sphaeros. This would give them, as we have already noticed, a close analogy in Empedocles to their own philosophy.[2]

Of the duration of the two periods, no certain evidence is given. It is not impossible that the thirty thousand seasons which we are told the condemned soul must wander, has some significance in this connection. Inconsistent as are the *Physics* and *Purifications* in their main spirit, they are not without positive relation, as will be later shown. We are left wholly in the dark whether by thirty thousand seasons a definite period is meant, or simply an indefinite number.[3]

[1] Empedocles repeatedly differentiates as two moments, the "gathering all into one" from the "separating into many." Cf. also Plato, *Soph.*, 242 D.

[2] Cf. Simpl., *De Caelo*, 305, 21.

[3] The latter seems the more probable; Rohde, II², 180. Zeller thinks the statement has no significance in this connection, p. 780, 1. If it be a definite number it may be ten thousand years with Dieterich, *Nekyia*, 119. Cf. Plato, *Phaedrus*, 248 E; Herod., ii, 123, cited by Diels.

THE FIRST PERIOD

Of the period of Love we cannot form a detailed picture. Fragment 35 contains nearly all that we know about it. It is there implied that some elements of a description have previously been given, including an account of a whirling motion which is here taken for granted. Strife is described as making his way gradually to the outermost limits of the revolving mass of substances, and Love enters as he withdraws. As she enters, the elements are gradually united and form countless combinations of mortal forms "marvelous to behold." We have no hint whether or no this whirling motion was caused by Love. Possibly it, like the revolution in the present world, was caused by a disturbance in the equilibrium of things at the inception of her conflict with Strife. Whether the large masses of the elements were distributed as in the present world, we have no knowledge. It is not impossible that in the complete separation of the elements by Strife, the four were placed in concentric layers. In that case the organized world of the period of advancing Love would, in the general distribution of the elements, resemble the present one. We may be certain that it does not in all respects resemble the period of Strife, but there is no warrant for constructing a priori either its elements of likeness or difference, tempting as is the opportunity for conjecture.

The mode of death, for example, might be conceived with Dümmler in accordance with the logic of the system, as caused by too complete mixture.[1] The logic of the system may not, however, have been carried out by Empedocles. Judging from his philosophical method in general, we should expect to find in his account a few striking phenomena fancifully conceived, as presenting some features of contrast to the present world. Glaring inconsistencies might quite well be present. Empedocles is at no time a slave to logic, and here his fancy has a field all its own. It is hopeless to attempt to construct a priori the workings of that fancy. We must content ourselves with the few notices that have come down to us. These are confined to an account of the generation of animals. The members were created separately, persisted for a brief time in isolation, and afterward were joined together by Love. Some of the combinations effected were fantastic, such as oxen with the heads of men, and double-faced and double-breasted beings. We have already seen reason for referring these creatures, contrary

[1] Dümmler, *Ak.*, p. 220, attempts to reconstruct Empedocles' thought on this and certain other points in accordance with a priori logic.

to the accepted view,[1] to a period other than the present. The evidence that they belong to the period of Love is indubitable,[2] and it has been made clear that this is not the present world. The only counter evidence of importance that has been urged, is the account of Aetius: "Empedocles said that the first creations of animals and plants were far from complete. They were divided, having their members not fitted together; the second had the members joined and were fantastic creatures; the third were forms with no differentiation of members,[3] and the fourth were beings produced, not from the simple elements, as from earth and water, but through union with one another."[4] Here the creation of the separate limbs and of the monstrous combinations are the first two of four successive forms of creation of plant and animal life. Taken by itself the passage would naturally suggest the reference of all these modes of generation to the present world. Yet Aetius does not tell us that they belong to the same period, nor that they depend upon one another. The passage is, moreover, so extremely condensed that there is no difficulty in supposing that the enumeration embraces the forms of generation in both periods. The order in which they are mentioned is chronologically correct, if, as already urged, the period of Love is the one first in order in Empedocles' description.[5] Whether in the period of Love plants were generated, we have no means of knowing. The passage of Aetius just cited is by him referred to plants as well as animals. Two of these stages we have referred to the period of Love. Zeller doubts the evidence of the passage regarding plants,[6] on the ground that no account is taken of it in the pseudo-Aristotelian, *De Plantis*, nor in Lucretius.[7] Some confirmation of Zeller's position is found in Aristotle. It seems that

[1] So Zeller, Diels, von Arnim, and others (cf. Diels, *Hermes*, XV, 168).

[2] Ancient authorities upon this point appear to be unanimous, with the exception of Philop., *Phys.*, 314, 7, and 17, on which cf. p. 48. Cf. Arist., *De Caelo*, Γ 2, 300 *b*, 25; Simpl., *De Caelo*, 587, 18; *Phys.*, 371, 33.

[3] It is true, as Gomperz remarks, that the reading ὁλοφυῶν rests upon conjecture; yet it is almost a certain conjecture, for so significant a stage could hardly be omitted in Aetius' account. It refers primarily to men and women and not to animals in general. Yet it would seem that it must have positive relation to the mode of generation of animals.

[4] Aet., v, 19, 5.

[5] This view agrees with that of Burnet, save that, as already noted, he is compelled to reject Aetius' evidence as to the chronological sequence of the four forms of existence, since he treats the Sphaeros as the starting-point of the world cycle.

[6] *Ueber die griechischen Vorgänger Darwins;* Zeller, *Abh. d. Ak. zu Berl.*, 1878, 111.

[7] Lucretius, v, 782, ff., 837 ff.

evidence on this point was not known to him, from his inquiry whether monstrosities in the plant world were produced to correspond with the "oxen-kinds with the faces of men."[1] But Fragment 20 mentions plants along with men and animals as among the existences whose members sometimes wander in isolation on "the shore of life." Probably Empedocles meant to include plants, but gave no specific account of them.

We do not know whether the creations of this period were all monstrosities. Fragment 62, describing the generation of men and women in the present world, hardly seems to admit of a preceding account of their formation, but we are told by Censorinus and Simplicius[2] that men were created by the union of the separate members. Censorinus' statement is obviously based on a very slight knowledge of Empedocles, and we shall presently notice the lack of originality in this passage of Simplicius.[3] We may regard it as not impossible, though not certain, that they were so created.[4]

EVOLUTION

In connection with the mention of the monstrosities belonging to this period are made the statements of Aristotle and his commentators, on the basis of which has been attributed to Empedocles an anticipation of Darwinian evolution. Such an attribution, tempting as it is, is hardly justified by the evidence. Simplicius, to be sure, tells us that in the chance putting together of the members by Love, those combinations survived which were adapted to fulfil the functions of nutrition, while the others perished.[5] But an attentive reading of the entire passage, in connection with the chapter of Aristotle upon which it is based, gives unmistakably the impression that Simplicius attributes to Empedocles a view discussed by Aristotle in close connection with an allusion to Empedocles' "oxen-kinds with faces of men."[6] Aristotle's mention of Empedocles seems to be purely incidental. The most that can with certainty be inferred from the passage, is that these monstrosities perished because they were not organized so as to be able to maintain life. Such a remark is not more than a common-

[1] *Physics*, B 8, 199 *b*, 10.

[2] Censorinus, *De Die Nat.*, 4, 8; Simpl., *Phys.*, 372, 6.

[3] Cf. Zeller, 796, 1, upon the passage of Aristotle, which Simplicius follows.

[4] In the original poem Fr. 57, 58, 59, and 60, probably followed quite closely Fr. 35. Some time after them came Fr. 36. The fragments descriptive of the Sphaeros came still later and then 31, 32, and possibly 33.

[5] Simpl., *ad* Arist. *Phys.*, B 8, 198 *b*, 29. Philoponus comments on the same passage of Aristotle to precisely the same effect as Simplicius.

[6] The coincidence even of minor phrases is unmistakable.

place, and cannot be regarded as even the germ of Darwinian evolution.[1] It does not recognize the dependence of later stages upon earlier.[2] The changes in the organization of plants and animals are incident to the advance in the world cycle. Even if we ascribe to Empedocles all that Simplicius suggests, we have still to do simply with the survival of the individual organism, and hence have absolutely no basis for evolution. The barrier between animal life and man is not broken down, nor that between plant and animal life. They are to be sure all endowed, as is inanimate matter, with perception and feeling, but each generates only its own kind, and no progression is made from one to the other. It is only the accident that Empedocles' system was cast in the mold of an advancing cycle, that has given his fanciful suggestions about the creation of animal life an appearance of greater dignity than the other systems of his time. Indeed we have not in him even a consistent advance. The period of Strife is thought of as a retrogression from beginning to end, and the men of today, we are told, are but infants compared with those of the past.[3]

Empedocles' interesting suggestion, Fragment 82, regarding the essential identity of leaves, hair, wings, and scales, should not be overlooked in this connection.[4] There is no reason to ascribe to him the thought that these forms were developed one from the other, or to suppose that in any way he carried out the implications of the observation. But it is a most significant instance of the poet's delight in coincidences and analogies, the acuteness of which sometimes brings him to the brink of great discoveries. While Gomperz assumes much in calling him the forerunner of morphological science, the fragment is very suggestive in this connection.

THE SPHAEROS

Of the further description of the world process in this period, we know nothing. Love finally triumphed and all the elements were completely

[1] Gomperz, p. 196, while he does not attribute to Empedocles so much as do many writers, notably Windelband, 50, and Lange, *Gesch. d. Materialismus*, i, 1, still gives him too much credit at this point; cf. also *Ueberweg Grundr.*, i, 74.

[2] Aet., v, 19, 5, is taken wrongly by Windelband, p. 40, to imply that the higher do grow out of lower forms of life.

[3] *Ueber die griechischen Vorgänger Darwins;* Zeller, *loc. cit.*

Zeller has called attention to the fact that an evolutionary theory, based on chance, could not appear until the teleological view of the world had been more thoroughly developed than was the case at this time.

[4] Cf. also the suggestion in Fr. 76, which evidently was part of an attempt to bring into definite relation the bone skeleton of some animals with the protecting shells of others. Cf. Pseudo-Arist., *De Spiritu*, 6, 484 *a*, 39.

mingled in the form of a Sphere. Strife was banished.[1] Whether he was pictured as taking any specific form, we have no means of knowing. It is too much to say with Burnet that he was pictured "no doubt surrounding the Sphere in circular layer."[2] It is true that Empedocles shared the tendency of early Greek thought to represent everything in a spatial perception, but even the clear light of a Greek imagination does not define all outlines, and this may have been one of the points left in shadow. If a definite picture was suggested, it may well have been a mythologizing one, as in the description of the re-entering of Strife into the Sphere.

The mingling of the elements in the Sphaeros was so thorough that no one of them manifested its individual qualities therein.[3] It is spoken of as "one,"[4] and as a god;[5] in the fragments it is personified throughout. "He rejoices in the isolation that surrounds him."[6] He has no hands and feet.[7] This personification is not poetic merely; here, no less than in his theory of the elements, Empedocles is a hylozoist, or perhaps better, as Gomperz puts it, a hylopsychist.[8] It would be strange indeed if "all things were endowed with intelligence," and the Sphaeros not.[9] Aristotle's phrase "the most blessed god" doubtless is true to Empedocles' thought, though foreign to his phraseology.[10] From Empedocles' point of view the highest form of conscious life may belong to the Sphaeros without departing from the view that he is simply a mixture of the elements. For as simple

[1] That Hate is excluded from the Sphaeros needs no proof after Zeller's summary of the evidence, p. 781, 1.

[2] P. 251. This suggestion seems to be adopted from Tannery, p. 309.

[3] Fr. 27. The two lines wherein this is stated are by Plutarch referred to the time when Strife is dominant; so Mullach, Tannery. Simplicius, however, refers them to the Sphere.

[4] Fr. 17, 7; 20, 2; 26, 7; 35, 5.

[5] Fr. 31.

[6] Fr. 28.

[7] Fr. 29.

[8] Cf. Gomperz, p. 197.

[9] Fr. 103 and 110, 10.

[10] *Met.*, B 4, 1000 *b*, 3. The trivial character of Aristotle's criticism, of which this forms a part, does not vitiate the value of the hint it contains on the point under discussion. The criticism is that the blessed god has not as full knowledge as other beings, since he lacks knowledge of Strife. Gomperz, we may note in passing, has strangely mistaken the meaning of this passage. He attributes to Empedocles himself the conclusion drawn by Aristotle as an objection to Empedocles' theory, and cites it as an instance of "die strenge Folgerichtigkeit . . . . mit welcher der Akragantiner seine Grundgedanken hier bis in deren äusserste Konsequenzen verfolgt hat" (p. 198).

mingling furnishes the basis for, indeed constitutes, the higher forms of conscious life in the world as we know it, so in its complete form it may constitute a perfect consciousness.

Whether the Sphere was homogeneous is a question incapable of answer in the strict sense of that term, because Empedocles had evidently not faced the problems involved in it.[1] The same difficulty confronts us on a large scale here, as in the attempt to ascertain just what he means by mixture in the individual combinations of the present world. The same answer must be given here as there, that he evaded the problems involved, or did not see them. The searching Eleatic criticism of the problem of the "one and many" was really passed by without being comprehended, and the terms "one" and "mingled" were used as indefinitely as in common language. Mingled here means, as in the individual organisms of the present world, some sort of fusing and transforming; a "making like." Further definition than this, it did not receive.[2] To Aristotle's mind the unity effected was such as to preclude the possibility of the elements' retaining their identity in the Sphaeros. Though he recognizes that the hypothesis of a new generation of the elements out of the Sphaeros was inconsistent with Empedocles' assertion of their eternity,[3] he nevertheless repeatedly refers to the Sphaeros as a mixture.[4] This superficial inconsistency in Aristotle's notices, need not surprise us. It arises naturally from the ill-defined character of Empedocles' position.

As we should expect, the Sphaeros, partly because of the indefiniteness of the doctrine, furnishes a fertile field for the conjectures of later Greek writers. In Aristotle this tendency begins with a somewhat cautious analogy between the Sphaeros and his own indeterminate matter. In later writers it is unequivocally asserted to be without qualities,[5] and is identified now with potentiality, now with the neo-Platonist "intelligible world,"

[1] It is so regarded by Tannery, p. 309.

[2] We have no assurance that Empedocles himself described the Sphaeros as a mixture. Mingling is, however, his usual word for Love's work of union. Burnet assumes that the Sphaeros is unequivocally described by Empedocles as a mixture.

[3] *De Gen. et Corr.*, A 1, 315 *a*, 3 ff., and 18 ff. "For he denies that the elements can come one from another, ... and yet, at the same time, when he brings together into one the whole creation with the exception of Strife, each must be again produced from the one. . . . . For surely fire and earth and water could not have kept their identity when the universe was one."

[4] *Met.*, N 5, 1092 *b*, 7; A 10, 1075 *b*, 4; A 2, 1069 *b*, 22; *Phys.*, A 4, 187 *a*, 23.

[5] Philop., *De Gen. et Corr.*, 19, 7, a paraphrase of Arist., *De Gen. et Corr.*, A 1, 315 *a*, 3, but very inaccurate in its inferences.

now with Love,[1] now with ἀνάγκη.[2] These are all vagaries of interpretation without historical basis.

One cannot help wondering how far Empedocles' thought of the Sphaeros contained the germ of the idea, later so dominant, that the highest state of being contains no differentiation of individual existences. It is quite clear that the Sphaeros is thought of as a blessed state of being, but it seems likely that the conception received no further development in his hands.

[1] The source of this error is to be found in Aristotle's careless statement, *Met.*, B 1, 996 *a*, 8. Cf. I, 2, 1053 *b*, 15. Zeller's attempt, 763, n. 4, to justify Aristotle at this point is hardly successful.

The identification of the Sphaeros with Love found a modern supporter in Ritter.

[2] The root of this identification of the Sphaeros with ἀνάγκη is probably the "mighty oath" of Fragment 30, which is translated into prose by Arist., *Phys.*, θ 1, 252 *a*, 9, in a form that easily develops into the statement of Aet., i, 7, 28, where Empedocles' theory is really under consideration.

THE SECOND PERIOD

The beginning of the dissolution of the Sphere is described with a strong touch of poetic imagination. "All the members of the god trembled."[1] Our accounts of the succeeding cosmic process are most inadequate. First air was separated off, then fire, each containing apparently some admixture of the other.[2] From some of the air was formed, by the action of fire, a crystal vault which encircles the entire heavens.[3] Its shape is described by Aetius, but not with perfect clearness. It was perhaps a flattened sphaeroid, as Zeller suggests.[4] Beneath this vault two hollow hemispheres were formed, one of fire, one of air, for in this first separation fire was borne upward, air down beneath the earth.[5] The weight of fire causes the revolution of the heavens. The earth remains in the center,[6] held there by this revolution[7] and from it the sea is pressed

[1] Fr. 31.

[2] Plut., *Strom.*, 10 (*Dox.*, 582); Philo, *De Prov.*, ii, 60, p. 86. Earth, which is spoken of as remaining after the others are separated out, is later shown to contain some mixture of the other elements. Fire is also found to contain air, of which the moon is subsequently formed. Since the stars are fastened to the crystal vault, the fire of which they are composed would seem to have been carried out with the aether that first separated itself.

[3] Aet., ii, 11, 2; Lactant., *De Opif. Dei*, 17, 6; Philo, *De Prov.*, ii, 60, p. 86.

[4] Zeller, p. 787, 2. Tannery and Burnet believe that Empedocles borrowed from the Orphics the notion that it was egg-shaped. But the description of Aet., ii, 31, 4, suggests merely that its position is like an egg, with its larger dimension the horizontal one. We have no evidence that even this allusion to an egg is derived from Empedocles himself. The description reads as follows: E. *τοῦ ὑψους τοῦ ἀπὸ τῆς γῆς ⟨εἰς τὸν⟩ οὐρανόν, ... πλείονα εἶναι τὴν κατὰ τὸ πλάτος διάστασιν, κατὰ τοῦτο τοῦ οὐρανοῦ μᾶλλον ἀναπεπταμένου, διὰ τὸ ᾠῷ παραπλησίως τὸν κόσμον κεῖσθαι.*

[5] *De Gen. et Corr.*, B 6, 334 *a*, 1, seems to refer to this time, with Fr. 54 and 55.

[6] Arist., *De Caelo*, B 13, 295 *a*, 13. Its form is not specified but was probably spherical, for it is the residuum of the original sphere after other things are taken out, and it is the center of revolution, being pressed into shape apparently by that revolution. Cf. Philo, *De Prov.*, ii, 60, p. 86.

[7] The equilibrium of the entire heavens seems to be due to this revolution, Arist., *De Caelo*, B 1, 284 *a*, 25. A reference to this revolution as the cause of the earth's stability should probably be restored in Philo, *De Prov.*, ii, 60, p. 86. "Quietis autem inde causa per deum," where Wendland suggests that *δῖνον* originally stood, and was misunderstood by the translator. The following words: "Non vero per sphaeras multas super se invicem positas, quarum circumrotationes poliverint figuram," are probably, as Wendland suggests, a criticism of the Stoic position. A further statement

out.[1] The sea seems at first to have surrounded the earth in a layer, and later to have been collected into its present form. Most writers have supposed that the separation of the great masses of the elements as they appear in our world, was effected by a whirling motion, in accordance with the traditions of the Ionians.[2] But the revolution of the heavens is expressly said to begin after the separation was partly effected.[3] The view in question seems to be necessitated, as already noted, by the supposition that the present world is the world of Love. The separation is, however, exactly what we should expect as the result of the operation of Strife.[4] The elements seem to have "distributed themselves" capriciously, or by weight.[5]

This is clearly the place in the cosmology to which the passages of Aristotle already mentioned refer, wherein the motion of aether and fire are described as independent of Love and Strife.

The revolution of the heavens is explained by the lack of equilibrium in them.[6] The revolution was at first slow, lasting ten months. We are not told what was the cause of the acceleration, nor whether it was gradual or abrupt.[7] The earth clearly has a tendency to sink downward, otherwise

of Empedocles' theory follows: "Quia circa eam compressa fuit Sphaera ignis mirabilis (magnae enim et multiplicis theoriae vim habet), ideo nec huc nec illuc cadit ista." Regarding this part of the account we may quote the following from a private letter of Conybeare: "The words 'magnae enim et multiplicis theoriae vim habet' are a mistranslation. Render 'magnae enim et multiplicis formae vim habet'—a reference, I think, to the belief of Aristotle that circular movement is the most perfect of movements. In the preceding sentence, for the word 'lambar' rendered 'ignis,' another MS has καλαραν = 'typus,' 'forma,' or 'exemplar.' The rendering would so become 'quia circa eam circumjectus est (περιεβλήθη or συνεκλείσθη) typi cuiusdam gyrus,' 'round the same was closely thrown a wonderful whirl of a kind.' This I think the better reading." Accepting Conybeare's suggestions in the main, we may question the reference to Aristotle's belief regarding circular motion. The clause is obscure, and perhaps corrupt.

[1] The description of it as "sweat" is a figurative account of this process. A characteristic employment of analogy is the explanation of its saltness by this means. Cf. Fr. 55; Arist., *Meteor*, B, 3, 357 *a*, 24; Aet., iii, 16, 3; ii, 6, 3. The sea contains sweet water as well as bitter. Ael., *Nat. An.*, θ, 64.

[2] Tannery, Zeller, Gomperz, and others; while Burnet gives essentially the view here presented.

[3] Plut., *Strom.*, 10.

[4] διέκρινε γὰρ τὸ Νεῖκος, Arist., *De Gen. et Corr.*, B 6, 334 *a*, 1.

[5] Philo's account gives much more importance to weight.

[6] Plut., *loc. cit.*

[7] Aet., v, 18, 1. Tannery, p. 314, assumes that it is gradual and is the resultant of the local and haphazard movements caused by Strife. This is a groundless assumption, and a most inadequate basis for his attributing to Empedocles the principle of conservation of energy.

the revolution of the heavens would not need to be invoked as an explanation of its stability.[1] As already noticed, a variety of bases of explanation of cosmic phenomena are employed, most of them without analysis or discussion.[2]

THE HEAVENLY BODIES

Of the formation of the moon and stars we have a few hints. The former is air, taken off with the fire and hardened like hail in a disc shape.[3] It gets its light from the sun, and is half as far from the earth as he.[4] Hardening processes in several instances are attributed to fire, after the analogy of baking.[5] The stars are bits of fire contained in the air in its first separation, and pressed out from it; the fixed stars being fastened to the crystal vault.[6] Regarding the nature of the sun, the evidence is so confusing and contradictory as to require more detailed consideration. Indeed, no possible hypothesis will reconcile all the data. Some of them must be rejected, if any attempt at reconstruction is made.

The two most important passages bearing upon the question read as follows:

He says that from the original mingling of the elements the air was separated off, and spread around in a circle. After the air, the fire rushed out, and finding no other place, ran up underneath the hard substance around the air. In a circle around the earth move two hemispheres, one simply of fire, the other a mixture of air and a little fire, which he thinks is night. Their motion began from the fact that the fire as it was collected chanced to weigh too heavily. The sun is not fire in substance, but a reflection of fire, like that produced from water.[7]

Empedocles says there are two suns, one the archetypal consisting of fire, in

[1] It keeps its place like water in cups rapidly whirled around. Even as an analogy this fails. Arist., *De Caelo*, B 1, 284 *a*, 24; B 13, 295 *a*, 16; Γ 2, 300 *b*, 1. Note also that in the account of the growth of plants a natural motion of fire upward, and of earth downward is assumed. Arist., *De. An.*, B, 4, 415 *b*, 28.

[2] We are told that weight is not discussed, Arist., *De Caelo*, Δ 2, 309 *a*, 19, but we should be practically certain of it without that evidence.

[3] Pseudo-plut., *Strom.*, 10; D. L., 77; Aet., ii, 25, 15; ii, 27, 3; Plut., *De Fac.*, in *Orbe Lun.*, 922 C; Empedocles, Fr. 45; Aet., ii 28, 5.

[4] Aet., ii, 31, 1, as corrected by Diels. Empedocles was not the first to see that the moon shines by borrowed light; the Pythagoreans and Parmenides both knew it. The suggestion, Achill. in Arat. 16 (p. 43, 2 Maas), that the moon is a detached part of the sun, ἀπόσπασμα, seems simply an inaccurate statement based on Fr. 45.

[5] Note the hardening of the crystal vault, Aet., ii, 11, 2; of rocks, Arist., *Probl.*, K Δ, 11, 937 *a*, 15; cf. also Fr. 73 of Empedocles.

[6] Aet., ii, 13, 2, and ii, 13, 11.

[7] Pseudoplut., *Strom.*, *loc. cit.*

one hemisphere of the world, filling the hemisphere, always stationed opposite its reflection; the other the visible sun, its reflection in the other hemisphere, the hemisphere of air with a mixture of fire. This reflection is produced by a rebound from the round earth into the crystal sun, and is carried around with [the hemisphere of air] by the motion of the fire hemisphere; or, to state it briefly, the sun is a reflection of the fire around the earth.[1]

A number of questions immediately suggest themselves: (*a*) Is the air hemisphere night, as is stated in the first passage, or day, as the second implies by locating the visible sun in it? (*b*) How can the visible sun be a reflection of the fire opposite, and at the same time be a "reflection from the round earth"? (*c*) If the fire hemisphere be opposite the sun how can the night be dark when this fire is overhead? (*d*) What is meant by the "crystal sun"?

Among the scholars whose investigations in this field are regarded as significant, no agreement is to be found. According to Zeller the sun is a crystal body as large as the earth, which collects as a burning glass the light of the fiery day hemisphere, and streams it upon the earth.[2] The statement that the sun reflects the light of the opposite hemisphere, he supposes to be only an inference on the part of the ancient writers. Tannery maintains that it is an image of the earth, lighted up by the fire of the day hemisphere, and reflected upon the celestial vault of crystal.[3] Burnet subscribes to this view.[4] Diels retains more fully than any one else the statements of the ancient writers. The sun is a crystal lens of condensed mist containing particles of fire, lighted up by the rays streaming up from the opposite hemisphere.[5] Our knowledge of this portion of Empedocles' thought is so fragmentary, he remarks, that we may not hope to ascertain exactly the considerations which made this hypothesis acceptable.[6] The Pythagorean notion that the visible sun is a crystal which reflects the light from the central sun, may have been adopted without due realization of the

[1] Aet., ii, 20, 13.

[2] Zeller, p. 789.

[3] Tannery, p. 317.

[4] Burnet, p. 254. Here as often, Burnet has unduly simplified the problem in the interest of clearness of presentation.

[5] *Berl. Sitz.*, 1884, 352.

Gomperz, p. 195, regards the sun as a glass-like body taking up and reflecting the light of the aether, but he does not make clear whether or no it is the light of the opposite hemisphere which is thus reflected.

[6] Tannery, pp. 236 f., rightly remarks that we should not expect perfect clearness of ideas as to the laws of direction in reflections. He also makes the suggestive observation that highly polished surfaces under certain conditions present gleaming points of light, which may have been noticed by Empedocles.

difficulty involved in making the source of light revolve about the earth.[1] This position, conservative as it is from the point of view of historical evidence, has by no means the unanimous support of ancient testimony, and cannot be regarded as certain.[2] Tempting as is the field of conjecture in default of decisive evidence, it is in this instance surely wiser to acknowledge the insufficiency of our data and suspend judgment. We shall hazard but a few minor suggestions toward clearing up the question. It is not impossible that the confusion into which ancient writers have fallen is occasioned by an assimilation of Empedocles' theory to that of the Pythagoreans. If he had, for example, explained the sun as a mass of fire collected by a rebounding of the aetherial fire of the day hemisphere from the earth's surface, later writers would be almost certain to confuse this view with that of the Pythagoreans.[3] This assimilation might be responsible for the introduction of two elements into the Empedoclean cosmology, the idea of the crystal lens,[4] and the notion that the light of the sun comes from the opposite hemisphere. Against this derivation of the latter idea, we have two incidental statements, the weightier because incidental, that do not accord therewith.[5] Plutarch tells us that the moon is surrounded by the sphere of fire.[6] In the account of Aetius of the formation of the moon, we read that it "formed itself from the air cut off with the fire."[7] A further factor in bringing confusion into the study of this problem is the failure to observe that a reflected image with Empedocles was of precisely the same stuff as the object reflected. The particles sent forth by the object are "packed together" on the reflecting surface, and sent back through the

[1] Gomperz, on the other hand, suggests that the early Pythagoreans may be indebted at this point to Empedocles.

[2] Philo, *De Prov.*, ii, 60, p. 86 says nothing of the two hemispheres or of the idea that the sun is a reflection, although he gives an account of the separation of the heavens.

[3] Even Karsten's suggestion, p. 429, that the late Greek accounts of Empedocles' view of the sun are really imaginative expansions of Fr. 44, does not seem wholly beyond the range of possibility.

[4] The observation, Aet., ii, 1, 4, that the "circuit of the sun marks the boundary of the world" should be interpreted in the light of Aet., ii, 23, 3, where the encircling vault is said to cause the solstices by preventing the onward course of the sun. This last passage distinctly militates against the supposition that the reflection is upon the vault itself.

[5] The three direct witnesses to this point, Plutarch and Stobaeus (Aet., ii, 20, 13) and Pseudo-Galen, 62 (*Dox.*, 626) go back clearly to the same original and have, therefore, only the force of one testimony.

[6] *De Fac. in Orb. Lun.*, 922 C.

[7] Plut., *Strom.*, 10.

force of the fire streaming from this reflecting surface.[1] Therefore, even though the sun be a reflection, it is also a mass of fire.[2]

We may make one more suggestion toward clearing up the difficulties of this problem. The view that the night hemisphere is the one filled with fire, is not disproven by the observation that in that case the night would be blinding day Fire is not perceived unless it approaches the eye. It may be spread out in the heavens through the whole hemisphere that encircles us without our perceiving it. It may travel from one hemisphere to the other in large quantities without coming to us.[3] This is the point of Aristotle's criticism of Empedocles in a well-known passage of the *De Anima*,[4] a passage which has usually been taken to refer simply to the time it takes light to travel, but it is quite clear that it refers rather to the possibility of light being present in a medium without "actualizing" it, that is, without being perceptible throughout that medium. Empedocles' recognition that it takes time for light to travel does not seem, as is thought by Gomperz and others, remarkable from a scientific point of view. It is simply an obvious accompaniment of the view that light is material.

A few further observations regarding the heavens may be noticed in passing. As with the Pythagoreans the world has a right and left side, the former toward the summer solstice.[5] The north side of the heavens is higher than the south, caused by the impetus of the fire hemisphere.[6] The heavens above the moon are, as is usual in antiquity, regarded as a purer region than the earth and its neighborhood.[7] Eclipses of the sun are correctly explained by means of the interception of the moon.[8]

PLANTS

Among plants, trees were the first to be formed, as Aetius tells us,[9]

[1] Aet., vi, 14, 1.

[2] ἄθροισμα πυρὸς μέγα, D. L., viii, 77; cf. Philo, *De Prov.*, ii, 60, p. 86, and Aet., ii, 6, 3. Note especially in this connection Empedocles' own words, Fr. 41.

[3] We have no reason to suppose that Empedocles recognized any invariable law for the direction of the motion of fire and of light. In general, they are doubtless thought of as moving in straight lines, but we should, in our thought of him, rid ourselves of the implications of our strict scientific notions on this point.

[4] Arist., *De An.*, B 7, 418 *b*, 20. Philoponus in his note to this passage refers it to the time it takes for light to travel, and the kindred passage of the *De Sensu*, 6, 446 *a*, 26 probably has this reference, but I believe an attentive reading of the *De Anima* passage in its full context, suggests the interpretation here given.

[5] Aet., ii, 10, 2.

[6] Aet., ii, 8, 2.

[7] Hippol., *Ref.*, i, 4, 3.

[8] Fr. 42; Aet., ii, 24, 7.

[9] Aet., v, 26, 4, for this and the following points.

before the sun was spread out around [the heavens][1] and before day and night were parted. Because [the elements] were mixed in due proportions, no account was made of male and female. They grow by being pushed up by the heat in the earth, so that they are parts of the earth just as the embryo in the body is a part of the womb. The fruits are formed from the excess water and fire in the plant. Those trees that have not enough moisture lose their leaves in summer, when it evaporates, while those that have more keep them, as the laurel, the olive, and the palm.[2] The differences in the taste [of the fruits] are due to variations in the composition of the soil, and to the different way in which the plants draw the "homoiomeries" from the sustaining substance, just as is true of vines. For it is not a difference in the vine that makes wine good, but a difference in the soil that supports it.

Most of these points are true of plants in general. In some instances we have explicit statement to that effect. We are told that the tendency of fire upward and of earth downward is the cause of the growth of the limbs and roots respectively, in all plants.[3] It seems to have been recognized that in some plants there is distinction of sex.[4]

Plants are said to have been created in an incomplete state of the world;[5] animals as it progressed farther. Incompleteness in this instance means merely less differentiation in the organism than later on, if the generation described belongs, as we suppose, to the period of Strife. Indeed, in the passage quoted concerning trees, this is explicitly stated, and the imperfect development of sex accords well with the view.

Conscious life is attributed to plants, as to all nature.[6] They are expressly said to feel pleasure, pain, desire, and intelligence.

Regarding the nutrition of plants we are left almost wholly to inference, being merely told that they take nourishment imperceptibly from their environment.[7]

[1] περιαπλωθῆναι is appropriate, since the entire hemisphere was filled with fire. Burnet suggests the questionable emendation: πρὶν πυρὶ πιληθῆναι "before [the earth] was solidified by fire." Reiske suggested περικυκλωθῆναι.

[2] Plut., *Quaest. Conv.*, 649 C, the symmetry of the pores is named as an additional cause of this phenomenon.

[3] Arist., *De An.*, B 4, 415 *b*, 28; Theophr., *De Caus. Plant.*, i, 12, 5. Theophrastus observes further that the roots are made chiefly of earth, the leaves of air.

[4] Pseud.-Arist., *De Plant.*, A 2, 817 *a*, 1 (cf. 815 *a*, 20).

[5] *Ibid.*, 817 *b*, 35.

[6] Pseud.-Arist., *De Plant.*, A 1, 815 *a*, 15; *b*, 16.

[7] Plut., *Quaest. Conv.*, 688 A.

ANIMAL LIFE

The third and fourth forms of generation of animals indicated by Aëtius we refer to this period, as already noted.[1] Of the first of these we possess Empedocles' own account.[2]

First of all, whole-natured forms of earth sprang forth, with a portion in them of both water and warmth. These were sent upward by fire, eager to reach its like. In them was not yet seen the lovely contour of the human form, nor voice, nor the members belonging to man.

These "whole-natured" forms were evidently fashioned within the earth by the agency of Love, and then forced to the surface by fire.[3] The attempt to explain this passage as the third stage of a continuous and progressive series is clearly very difficult. It has led to the assumption that they are human beings similar to those fancied by the Platonic Aristophanes, in which sex is not yet distinguished.[4] But it would seem from Empedocles' words that differentiation of members has not gone far enough to justify this interpretation.[5] Aristotle's comparison of the "whole-natured" forms to *seed* also suggests very rudimentary forms of existence.[6] The succeeding steps of differentiation are not preserved to us. We do not even know whether it was gradual or abrupt. The decisive point was reached, according to Aetius, when the differentiation of the sexes was effected, and reproduction took place through their union.[7] Until this

[1] Cf. the passage as cited, p. 57. [2] Fr. 62.

[3] Von Arnim supposes these to have been the animal trunk to which the several limbs attach themselves.

[4] Diels, *Frag. Poet.*, *ad* Fr. 62. "*οὐλοφυεῖς* sunt homines sexus nondum divisi quales fingit Aristophanes Platonicus." The translation of the *Vorsokratiker*, "rohgeballte Erdklumpfen," does not, however, carry out this idea.

[5] Simplicius attempts a definition, *Phys.*, 382, 17: *ὃ καθ' ὅλον ἑαυτὸ πᾶν ἐστιν ὅπερ ἂν ἐστι* (*sic*). This is hardly in the spirit of Empedocles' untechnical and perhaps not over precise conception, but is perhaps nearer the truth than the view just mentioned.

[6] *Loc. cit.* Aristotle's language is inexact, but the context makes his meaning clear. He says, *καὶ τὸ οὐλοφυὲς μὲν πρῶτα σπέρμα ἦν*; that is, "the true whole-natured form is seed." Simplicius wrongly supposes him to give this as an interpretation of Empedocles' own intention. The extreme abbreviation of the passage of Aristotle is apparent. It reads like desultory and hasty notes on the subject.

[7] Zeller's objection, p. 795, 1, to placing these two forms of generation in the period of Love, is that *γένεσις δι' ἀλληλῶν* which is the specific work of Aphrodite, must, according to it, be brought to pass through the further advance of Strife. This objection is hardly valid. *γένεσις δι' ἀλληλῶν* is no more the work of Aphrodite than the "whole-natured forms." Empedocles may well have thought of the differentiation of the members as a less perfect expression of her organizing power.

point they sprang from the earth "like vegetables," some of the ancient accounts say.[1] The animals which have more heat in their composition seek the coldest abiding places.[2] The first men are said to have been produced in the south [and east ?] the first women in the north.[3] In general men are warmer than women and in reproduction this is given as the basis of the differentiation of the sexes.[4] Parmenides, it will be remembered, held just the reverse. That the first men were formed in Attica, in comparison with whom the men of the present are as infants, is an interesting acceptance of mythological tradition.[5] In relation to these facts should perhaps be placed the account of the golden age in which Kypris is queen.[6] However great may be the gap between the spirit of the *Purifications* and that of the *Physics*, this passage is so distinctly influenced by the place given Aphrodite in the *Physics* that we cannot avoid bringing it into relation therewith. The sentiments expressed fit in well with the identification of the present period with the period of degeneration. It is universally admitted that Empedocles' thought has throughout a strong touch of pessimism. It is not improbable that this tendency has something to do with the placing our world in the period when Strife is on the increase. And regarding the present world as far inferior to the past, puts his theory also into accord with a widely current tradition.[7]

[1] Varro, *Eumenid. Sat.*, Fr. xiv (Riese). The comparison probably is not Empedocles' own. It is used elsewhere of the Athenians, as autochthonous; Luc., *Philops.*, 3; Poliochus, *ap.* Ath., B 60 *c*. Censorinus, 4, 8, perhaps confuses the modes of generation of the two periods.

[2] Arist., *De Resp.*, 14, 477 *a*, 32; Theophr., *Caus. Plant.*, i, 21, 5.

[3] Aet., v, 7, 1.

[4] Fr. 65 and 67; Arist., *De Gen. An.*, Δ 1, 764 *a*, 1; *De Part. An.*, B 2, 648 *a*, 25. This seems inconsistent with Censor., 6, 6, but the two notions must surely have been combined, since both are well attested; cf. Galen, *ad* Hippocr. *Ep.*, vi, 48; Oribasius, *ad* Athen., iii, 78, 13, cited Diels, *Vors.*, 83. Empedocles seems to have held that the members of the body in some sense existed in the seed; cf. Fr. 63; Arist., *Gen. An.*, A 18, 722 *b*, 10; Δ 1, 764 *b*, 3 (cf. Censor., 5, 4).

On the time required for the development of the embryo, cf. Aet., v, 21, 1; 18, 1; Theon., Smyr., 104, 1; Censor., 7, 5. The heart is the first organ to grow, Censor., 6, 1; on the resemblance of offspring to parents, see Aet., v, 11, 1; and to others Aet., v, 12, 2; the explanation of twins and triplets, v, 10, 1. Other points concerning generation and birth are noted by Censor., 6, 10; cf. Fr. 68; Arist., *Gen. An.*, Δ 8, 777 *a*, 7; Soranus, *Gynaec.*, i, 57 (*Vors.*, 79).

[5] Aet., v, 27, 1. Should we associate with this the suggestion that a day was originally nine months long, and conclude that all life had the same large scale? Aet., v, 18, 1.

[6] Fr. 128 and 130.

[7] It is not, to be sure, the universal tradition, as the Prometheus legend shows.

Empedocles' account of the inception and mode of operation of the breathing process, possesses an especial interest because one of the longest fragments that we possess deals with the subject. This passage, moreover, contains a most characteristic illustration, that of the child playing with a clepsydra. Furthermore, the doctrine connects suggestively with the theory of pores. The first inception of breathing is described by the Doxographers as due to the departure of moisture from the young organism and the rushing in of air to take the place made empty. After that the outward impulse of heat in the body drove out the air, causing expiration. The return of the air was the corresponding inspiration.[1] The present process is also described by the Doxographers in essential accordance with the account in Fragment 100 save that no account is taken of the fact that respiration takes place over the whole body and not simply through the nostrils. The cause of the expiration and inspiration is the rushing of the blood back to the heart and again to the surface of the body, alternately allowing the air to rush in through the pores of the skin, and forcing it out again. So a child playing with the clepsydra alternately fills it with water and air. Why two forms of inception of the breathing process should be given is not easy to explain. It seems to be an attempt to account for the starting of the process by causes recognized as operative elsewhere in the physical world. The impulsive power of fire has often been noted. The process, once started, would continue of itself or rather would be taken up like the vibration of a pendulum, by the air and blood combined.[2]

[1] Aet., iv, 22, 1.

[2] Fr. 100. The clepsydra experiment of these lines is probably to be understood essentially as by Burnet, though in minor points his interpretation may be questioned. The clepsydra employed had a very small opening αὐλοῦ πόρθμος or πόρος (ll. 10 and 17) through which the water escaped, and at the other end several perforations through which it was filled by plunging it in water (τρήματα πυκνά, l. 13; ἰσθμός, l. 19). Perforations and not a large opening were used, we may conjecture, in order to prevent the entrance of foreign substances which would block the small orifice, or make the water flow from it unevenly. Dictionaries of antiquities usually describe the αὐλός as a neck through which the clepsydra was filled, and the several openings as the avenue of escape. This is inherently improbable, for several openings would have no advantage over one in measuring the water as it escaped and would make the flow too rapid to be practicable in what was evidently a water-clock of small size. Aristotle, *Probl.*, 914 *b*, 9 ff., experiments are made with a clepsydra apparently similar to this one. The use there of the word ὀρθή (ll. 21 and 32) describing the clepsydra when the perforations are down and the neck up would seem to indicate that the perforations were the avenue of escape. But ὀρθή must refer, it would seem, to the position of the vessel when not in use. Possibly it had the general form of an ordinary urn, with the bottom perforated, so that it was by association of ideas thought of as inverted when the neck was down. The τρυπήματα cannot have been the usual

Digestion seems to have been described as a form of putrefaction,

outlet, for the reason already given, and further because the neck described by Aristotle is too small to be a convenient means of filling the vessel. For one of the experiments described (ll. 26 ff.) shows that its orifice was small enough for capillary attraction to prevent air inclosed in it from displacing water above, when the neck is turned downward.

In the usual descriptions of ordinary water-clocks but one orifice for the escape of the water is mentioned. Cf. Schol. *ad* Arist., *Vesp.*, 93; Suidas; Schol. *ad* Arist., *Ach.*, 693 and Richter., Prol. *ad* Arist., *Vesp.*, p. 134. The description of Aen. Poliorc. 22, 25, is taken by Daremberg and Sagglio, *Dict. des Antiq.* to be a clepsydra with several openings, some of which may be stopped with wax to vary the rapidity of the flow; "on oevrait ou l'on bouchart avec des tampons de cire les trous d'échappement et l'on pouvait ainsi faire varier la durée de l'écoulement." But the passage reads: *ταύτην (τὴν κλ ἐψυδραν) μεταβάλλειν διὰ δεχ' ἡμερῶν, μᾶλλον δὲ αὐτῆς κεκηρῶσθαι τὰ ἔσωθεν, καὶ μακροτέρων μὲν γιγνομένων τῶν νυκτῶν ἀφαιρεῖσθαι τοῦ κηροῦ, ἵνα πλέον ὕδωρ χωρῇ, βραχυτέρων δὲ προσπλάσσεσθαι, ἵνα ἔλασσον δέχηται.*

Wax must be spread on the inner surface of the vessel, to decrease its capacity (*ἵνα ἔλασσον δέχηται*). If some of the orifices were stopped with wax, it would be done when the days were longer to prolong the time taken to empty the vessel, not when they were shorter. This device is here employed to regulate military watches during nights of varying length.

In Empedocles' experiment the girl first plunges the vessel in water with her hand over the neck, then removes her hand, allowing the water to flow in and the air out (ll. 10–15). Then taking the vessel out of the water, filled, she first keeps the neck closed, then opens it, letting the water flow rapidly out of the perforated end (ll. 16–21). Diels complicates the second half of the experiment by supposing that the water only fills the body of the vessel, while air fills the neck, as in Aristotle, ll. 26 ff. The position of the clepsydra is reversed so that the neck is down. (Cf. *Poet. Frag.* Addenda.) In detail the interpretation affects the following phrases:

L. 16, *ἔχῃ κατὰ βένθεα χαλκοῦ*, a natural periphrasis for "occupies the interior of the brazen vessel," Burnet, but by Diels translated "*nur* den Bauch des Erzes füllt."

Ll. 18, 19, Diels: "die Luft die von aussen nach innen strebt" (he must mean the air in the neck of the vessel) "dass Nass an den Ausgang des engen, dumpf gurgelnden Halses zurückdrängt, indem sie die Spitze (*des Halses*) besetzt hält." It is true that *ἰσθμοῖο* seems more appropriate to the neck than to the openings at the other end, yet it can well be used of the latter and the thought of the passage is simpler and more natural on that basis. Sturtz's emendation of *ἰσθμοῖο* to *ἠθμοῖο* is very attractive, since Aristotle uses *ἠθμός* of this part of the vessel (l. 33).

ἄκρα κρατύνων not well translated by Burnet, "pressing upon its surface." The language is figurative, conceiving the air as like a besieging enemy "holding the heights" of a fortified isthmus. The figure is carried out in *ἐρύκει* and *πύλας* and constitutes a reason for retaining *ἰσθμοῖο*.

Ogle, following a suggestion of Stein, thinks it not improbable that the clepsydra of Empedocles and of the *Probl.* was the funnel-shaped nose of a watering pot. There seems to be no evidence in favor of this use of the term and the view can hardly be reconciled with the smallness of the *αὐλός* as described by Aristotle.

perhaps by a daring metaphor.[1] Its dependence upon moisture was recognized. Growth was due to the presence of fire.[2] To the departure of fire from the body were due both sleep and death.[3] The proportions of the elements employed in the formation of various parts of the body are recorded.[4] Two forms of madness seem to have been observed, but the brief notice preserved to us concerning them possesses no general significance.[5]

PHYSICAL PHENOMENA

Empedocles' suggestions upon detailed meteorological and physical phenomena have not the interest nor the significance of his physiological observations. A few of them should, however, receive notice here.

Lightning and thunder are caused by fire that has been collected within the clouds from the rays of the sun. The hissing of its contact with the mist, as it forces its way from the clouds, is the thunder.[6] Lightning is, of course, the gleam of this fire. Such seems to be Aristotle's conception of the theory.[7] The account of the *Doxography* gives the impression that it is the falling of fire into the clouds, not its bursting out, which causes the lightning. But Aristotle's account is no doubt the more trustworthy.

The oblique direction of winds, that is, for example, northwest or southwest instead of north or south, is due, as Zeller explains, to the complication caused by the tendency of the earth and air contained in the rising vapors to move in opposite directions.[8]

The seasons seem to be explained by the relation of the air in the lower atmosphere and the fire above it. Zeller supposes that the relation of the two hemispheres is meant, but this is hardly a possible meaning for the passage, and would be entirely inappropriate for the Stoics, who are classed with Empedocles as holding this view: E. *καὶ οἱ Στωικοὶ χειμῶνα μὲν γίνεσθαι τοῦ ἀέρος ἐπικρατοῦντος τῇ πυκνώσει εἰς τὸ ἀνωτέρω βιαζομένου, θερείαν δὲ τοῦ πυρός, ὅταν εἰς τὸ κατωτέρω βιάζηται.*[9]

[1] Pseud. Gal., *Def. Med.*, 99 (xix, 372); Plato, *Phaedo*, 96 B. Milk is similarly described, Fr. 68, as well as sweat and tears, Aet., v, 22, 1; Plut., *Quaest. Nat.*, 20, 2.

[2] Aet., v, 27, 1. [3] Aet., v, 24, 2, and 25, 4.

[4] Cf. Fr. 96; 98; Aet., v, 22, 1; and cf. p. 40 of this study.

[5] Cael. Aur., *Morb. Chron.*, 1, 5.

[6] Arist., *Meteor*, β 9, 369 *b*, 12; Aet., iii, 3, 7.

[7] Note also Aristotle's counter argument, *loc. cit.*, and Alexander's commentary.

[8] Olymp. in Arist., *Meteor*, 349 *a*, 32; Zeller, 791, 2. The source of Burnet's remark, that wind is caused by the motion of the two hemispheres, is not apparent. It surely cannot be an inference from this passage. Burnet, p. 256.

[9] Aet., iii, 8, 1; Zeller, 788, 1; Tzetzes *Exeg.*, ii, p. 42, 17, seems to describe these

The influence of heat within the earth in the formation of rocks was remarked, as well as in the production of hot springs.[1] Streams of water, he seems to have thought, wound repeatedly around a given portion of fire, thus becoming thoroughly heated.[2] The sea contains sweet water as well as bitter, since fishes live therein.[3]

PORES AND EFFLUENCES

The doctrine of pores and effluences has always had a somewhat isolated treatment in the accounts of Empedocles' philosophy. It is so difficult to correlate with other aspects of his thought that Diels even regards it as an anomaly in his system, borrowed, he thinks, from Leucippus.[4] So significant a doctrine, he says "could not have sprung up from the soil of a system so superficial and lacking in independence as Empedocles', but must have grown from the deepest root of the materialism of Leucippus." No one could have arrived at the theory, he argues, without the hypothesis of empty space, which Empedocles denied. This reasoning is not altogether conclusive. The theory may be ultimately incompatible with the denial of a void, but it might quite readily be developed by one who held that view, either with the thought that the pores were filled with a fluid substance which yielded to the entering particles of matter, or without raising the question whether they were empty or full.

The association of this doctrine by Plato and by the ancients generally with Empedocles' name, should in the absence of contrary evidence constitute a probability that it originated with him.[5] It seems to have had so definite a place and relation to certain aspects of his thought, that even if borrowed it must have become quite thoroughly his own. If, as seems likely, he left ambiguous whether the pores were empty or full, this would indicate that he formulated the doctrine in independence of the Atomists. Had he known their position, he could hardly have failed to approach that question. It is true that the theory cannot be correlated with all aspects of

successive encroachments at an earlier and more tumultuous stage of the world's life. *κατὰ γὰρ Ἐμπεδοκλέα τὸν φυσικὸν καὶ μετὰ τὸ γῆν φανῆναι καὶ θάλασσαν ἀτάκτως ἔτι τὰ στοιχεῖα κεκίνητο, ποτὲ μὲν τοῦ πυρὸς ὑπερνικῶντος καὶ καταφλέγοντος, ὁτὲ δὲ τῆς ὑδατώδους ὑπερβλυζούσης καὶ κατακλυζούσης ἐπιῤῥοῆς.*

[1] Arist., *Probl.*, 24, 11, 937 *a*, 15; Plut., *Prim. Frig.*, 19, p. 953 E. It is interesting to note in this connection that the hardening power of fire is probably responsible for the large proportion of it found in bone; Fr. 96; cf. Fr. 73.

[2] Seneca, *Nat. Quaest.*, iii, 24; cf. Fr. 52.

[3] Aelian, *Hist. An.*, ix, 64.

[4] Diels, *Emp. u. Gorg.*, *loc. cit.*; cf. also *Leucippus u. Dem.*

[5] Plato, *Meno*, 76 C; Arist., *De Gen. et Corr.*, A 8, 324 *b*, 33 with Philop. commentary.

his thought, yet that may be due to the fact that it was worked out in relation to certain specific problems, and was applied only where it proved helpful.

Though the doctrines of pores and effluences are supplementary, the theory of effluences seems to have had the longer history. The phenomenon of evaporation had always received much attention from the physicists, and is clearly a form of effluence. Heraclitus had called attention to the constant flowing away of particles from all objects.[1] In a sense Empedocles may be said, therefore, to have inherited this notion, though he developed its implications in many directions.

The doctrine of pores implies effluences, though the reverse is not the case. Everything, according to this view, was provided with pores, just as everything sent forth effluences. All mixture, growth, and sensation were conditioned on the "symmetry of the pores," that is, upon such a relation of pores and effluences that the particles of one substance could enter the pores of another.[2] Varied as are the phenomena in connection with which it receives mention, its root seems to have been the problems of sense perception. Certainly it is here that it proved most fruitful. It is true that many isolated phenomena of mixture are ingeniously solved by it. The incompatibility of oil and water, for example, most liquids mixing so readily,[3] and the superior hardness of certain metallic compounds to their constituents,[4] are happily explained by the reciprocal correspondence of their pores and solid parts to one another. But the relation of the hypothesis to the doctrine of Love as the cause of mixture, is so little indicated, that one cannot readily believe the two theories were worked out in connection with the same problems. What meaning can possibly be given to the progressing and eventually complete mixture of all things in the Sphaeros in terms of the doctrine of the symmetry of pores? In the ordinary processes of the world as at present organized, it is not so difficult to relate them. Symmetry of the pores is simply a negative condition of the unions Love effects, and the phrase "running through one another," describing the mixture of the elements, a phrase which occurs in close connection with mention of Love's powers, aptly describes the process of mixture through the fitting of pores and solid parts into one another. Yet very

[1] Cf. Heidel, *Archiv* XIX, 354. Whether the theory of effluences played so large a rôle as Dr. Heidel assigns it in early thought, is not easy to determine upon existing evidence. He has put beyond question the fact that it has a larger part than hitherto supposed.

[2] Theophr., *De Sens.*, 12.

[3] Cf. Fr. 91; Theophr., *De Sens.*, 12.

[4] Arist., *De Gen. An.*, B 8, 747 *b*, 3; cf. also the explanations of reflections Aet. iv, 14, 1; of the magnet, Alex., *Quaest. Nat.*, ii, 23 (Bruns, 72, 9).

slight reflection will show that difficulties confront us on every hand, if we attempt to press the theory very far in this connection.

Its usefulness in explaining the processes of growth is not slight, though we are left wholly to inference as to the method of its employment.[1] But it well explains the puzzling fact of the transmission of particles to all parts of the organism. The pores are the channels of this transmission. The same is true of those processes of change which affect all parts of an object simultaneously. Decay, equally with growth, is explained by the theory. Here, however, effluences carried out through the pores are the important factor. In relation to the facts of sense perception the value of the theory is at first sight apparent, and here, as already noted, is its most important sphere. In this realm it is not improbable that Alcmaeon was Empedocles' forerunner. Apparently Alcmaeon did not universalize the doctrine, but thought only of pores as the channels of transmission of sensation to the brain, with him the seat of intelligence.[2]

The details of Empedocles' working out of the theory as a basis of sense-perception will be noticed later.

It became clear very early in the history of thought, that the theory of pores led logically to atomism. Ancient writers repeatedly ascribe to Empedocles a sort of quasi-atomism, though in the earlier accounts it is stated as an inference which he himself did not draw.[3] And indeed this very fact is one of the reasons for concluding that the theory was something of an afterthought as applied to problems of mixture. For the pores seem to be thought of as tubes, not as simple interstices, which they must become so soon as employed with any thoroughness in explaining mixture. In the processes of sense perception they would naturally be thought of as tubes, as they certainly are in the account of the eye which has come down to us.[4] The same is true of the description of breathing, wherein the fine tubes all over the body play an important part.[5] Breathing seems to be typical of a process going on through all nature, even in inanimate objects. Outside the realm of sense-perception the doctrine seems to have been employed chiefly to explain individual phenomena, and to have been generalized

1 Only the fact is given in the passage of Theophrastus, *loc. cit.*

2 Theophr., 26.

3 Arist., *Gen. et Corr.*, A 8, 325 *b*, 5; *De Caelo*, Γ 6, 305 *a*, 1; Galen in Hippocr., *De Nat. Hom.*, i, 2 (K. xv, 32).

4 Fr. 84, 9.

5 Arist., *De Gen. et Corr.*, A 8, 324 *b*, 26 clearly conceives the pores as tubes. Note the phrase, κατὰ στοῖχον, l. 31.

without much regard to its efficacy in accounting for related facts, or to its compatibility with other theories.[1]

It has been suggested in the foregoing discussion, that perhaps Empedocles did not inquire whether the pores were full or empty. This view seems more than probable since Theophrastus implies it as a fact, and Aristotle assumes that to refute the doctrine he must refute both alternatives.[2] We have, to be sure, a late ancient testimony that they were filled with a fine substance like air,[3] and Tannery has suggested the hypothesis that they were filled with Love.[4] Neither of these positions is in itself impossible, but the evidence just cited militates strongly against them. Tannery's view has no ancient evidence to support it, and seems somewhat fanciful.

It is a remarkable fact that save in connection with the theory of pores, no occasion has arisen for mention of a problem, which before Empedocles received some attention from the Eleatics, and soon after in the hands of the Atomists became a fundamental matter, the existence of a void. For Empedocles the question is evidently not one of paramount importance, for it receives slight notice in the accounts of his philosophy and in the extant fragments. By Aristotle and Theophrastus we are told that he denied the existence of empty space.[5] Gomperz doubts the truth of this statement, but with hardly adequate reason.[6] It must be admitted that the lines often quoted from Empedocles himself to that effect are not so unequivocal as we could wish. They seem to have reference to the Sphaeros and not, as usually supposed, to an organic world.[7] Yet the statement made with reference to the indestructibility of the elements, "nothing is empty of them," seems to imply the absence of a void.[8] Confirmation has sometimes been sought in his undoubted recognition of the substantial character of air. Aristotle tells us that Anaxagoras and "others" attempted to prove the

[1] This impression is strongly conveyed by reading Theophrastus' account and criticism of Empedocles' theory of sense-perception, in which incidentally other applications of the doctrine of pores are discussed. Theophr., *De Sens.*, 1 to 24. Note in particular its happy employment as an explanation of the magnet, Alex. Aphr., *Quaest. Nat.*, ii, 53.

[2] Theophr., 13; Arist., *De Gen. et Corr.*, A 8, 326 *b*, 8 and 15.

[3] Philop., commentary on the passage of Arist. cited above.

[4] Tannery, p. 314.

[5] Arist., *De Caelo*, Δ 2, 309 *a*, 19; Theophr., *De Sensu*, 13.

[6] Cf. Gomperz's note to p. 191. His only ground for doubt is the irreconcilability of this statement with other doctrines of Empedocles.

[7] Fr. 13 and 14.

[8] Fr. 17, 33.

non-existence of a void by experiments with inflated bags and clepsydras, which he says merely prove that "air is something."[1] We have no reason to suppose that Empedocles is included in the indefinite "others" of this statement. Gomperz can hardly be right in supposing that the clepsydra experiment alluded to is the one described in Fragment 100 of Empedocles' poem. For this experiment is employed to illustrate the breathing process, and the substantiality of air is only incidentally illustrated by it.[2] Anaxagoras' clepsydra experiment discussed in the Aristotelian *Problemata* is probably the one referred to.

It is probable that Empedocles adopted the denial of empty space directly from the Eleatics. The difficulty of reconciling with it the theory of pores and effluences has been noted and was already recognized in antiquity. It may, however, have been overlooked by Empedocles himself.

PSYCHOLOGY

There is nothing in Empedocles that could properly be called a definition of the soul. Aristotle sought in vain for such a definition, and apparently found no statements upon which to base one except the characterizations of the mode of knowing and perceiving. Consequently he entangles himself in a confusing and misleading attempt to define it in terms of the ratio in the mixture of the elements.[3] This attempt is an inference from the definition of certain substances in terms of the relative amounts of their constituents, and from the definition of mental activities in terms of the material constituents of the body. It is quite in the manner of Aristotle to draw this inference, but, so far as we know, it was not involved in Empedocles' own reflections.

Both sense perception and thought, we are told, were explained materialistically. We must guard against taking this statement with its modern implications. Empedocles was not a materialist in the sense that would apply to one who had considered and rejected other alternatives. He was simply unable as yet to think in abstract terms. He pictured all things with sensuous imagery, because he belonged to an age which could not do otherwise. It would be a great mistake to ascribe to him the gross literalism, or the deliberate ignoring of certain aspects of experience, that goes with modern materialism. He had no prejudice in favor of a materialistic way of looking at things. Indeed, his thought is almost ready to break the bonds of its enslavement to that point of view, and he comes at least to the verge of the conception of pure spirit. And just because thoughts of spirit-

[1] Arist., *Phys.*, Δ 6, 213 *a*, 22.

[2] Arist., *Probl.*, 914 *b*, 10.

[3] *De An.*, A 4, 408 *a*, 13.

ual beings were new thoughts into which men were for the first time groping their way, he could employ them, unconscious of contradiction with other aspects of his philosophy, in a way that at a later time would be impossible. So, for example, he can describe Love in terms that approach an immaterial existence, and yet speak of her later as having length and breadth. So, too, the divinity of the third book of the *Physics* may be apprehended in terms that would be apt expressions of a spiritual religion, without occasioning himself or his hearers the feeling expressed by Diels of its inconsistency with the "atheistic materialism" of the earlier part of the *Physics*.[1] Intentionally atheistic Empedocles is not, any more than intentionally materialistic, though he might well seem both in some portions of his writings, to readers even a hundred years later. When we read, "for from these [elements] come all the things that were, and are, and shall be, yea, even the gods who live long lives and are exalted in honor" we are inclined to think it a definite and conscious denial of spiritual existences. But the gods of myth had never been conceived as immaterial. The passage denies simply as great a variety of kinds of material existences as were ordinarily assumed. The feeling after a conception of spirit would be like the first modern thoughts concerning the luminiferous ether, something superadded to the substances previously conceived, but not thought of as necessitating a revision of the notions of matter already held.[2]

That all the notices and fragments that have come down to us concerning sense-perception and thought are couched in material terms is, then, clearly to be expected, but we are not warranted in drawing from them for Empedocles the skeptical and conservative estimates of our powers of knowledge, that such statements in modern times would imply. We are not even justified in expecting him to hold consistently to what would seem an inevitable consequence, the mortality of the soul.

Between thought and sensation there is no clear differentiation in this respect. Both are equally material. We perceive objects by the like element in us, we think with the blood,[3] and the blood is but an effective mingling of the elements. There is clearly no suggestion here of differentia-

[1] Diels, *Sits. d. Berl. Ak.*, 1898.

[2] There is one line of the *Physics* which seems to leave a loophole for existences not formed from the elements. Fr. 23, 10, with its significant γέ, limits what is said to the things that are perceptible (δῆλα) to us.

[3] Fr. 105; Plato, *Phaedo*, 96 B; Theophr., *De Sens.*, 10. Cf. the statement, clearly colored by late modes of thought, in Aet., iv, 5, 8. The view is mentioned with no name, Arist., *De An.*, A 2, 405 *b*, 1.

We need not suppose other parts of the body beside the blood to be without thinking power. The blood is simply its chief medium.

tion of the two faculties. They are on precisely the same basis. Yet they are not identified in a fully conscious way, limiting our knowledge to that gained through sense perception.[1] The problem of their relation simply is not raised. They are differentiated only to the extent that common language distinguished them. Indeed we find hardly the degree of clearness that was present in Parmenides' thought. Empedocles is just on the verge of becoming fully aware of the psychological distinction between the two.[2] To ask in which truth is found is, therefore, a question that as yet has no meaning.[3]

It is clear that the attempts of late Greek thinkers to classify Empedocles' thought under the two heads, sense knowledge and rational knowledge, were mistaken. The statements made regarding one have their clear implications for the other. When we are told that by earth we see earth, we may rightly conclude that by earth we think and know earth. Crude, indeed, is this principle of knowledge of like by like, and we have no evidence that it was supplemented by any adequate consideration of the conditions of knowing aught save the material constituents of things.[4] We are told, to be sure, that in the blood is found the most complete and perfect mixture of the elements, with perhaps some little thought of power thereby secured to know substances as mingled.[5] But the poet is not yet aware of the great mystery of thought, and, with other early thinkers, overlooks it in favor of the absorbing problem of the crude material conditions of sense perception. How to get the object into the mind, or better how to establish connection between the thing outside and the blood or brain, that is for him and his contemporaries the great problem. And at

[1] Arist., *De An.*, Γ 3, 427 *a*, 26; *Met.*, Γ 5, 1009 *b*, 12 clearly are misleading.

[2] The statement of the Doxographers, iv, 5, 12, is clearly inferential.

[3] It is hardly just to describe his position as "hopeless vacillation" on this point, as does Diels, *Berl. Sitz.*, 1884, 343. He is said, *Dox.*, iv, 9, 1, to have declared the senses false. Diels seems to accept this as Empedocles' intent, but an intent which he was not strong enough to carry out.

[4] Cf. Arist., *De An.*, A 5, 409 *b*, 31.

[5] This thought is developed in the most naïvely literal way. The various kinds of minds, stupid, bright, impulsive, and slow, are explained by very simple and obvious differences in the way the particles are put together, their size, etc. Theophrastus, *De Sens.*, § 11, tells us that skill of one member, the hand, or the tongue, is due to an especially effective mixture of the elements in that part of the body. Fr. 110 is a striking instance of the same literalism in looking at the most highly developed philosophic thought. We are told that if we do not cultivate such thoughts without distraction, they will abandon us "each seeking its like." The explanatory words follow "for all things have a share in thought." The error of Burnet and Stein in referring this passage to plants is too obvious to need discussion.

this point the theory of pores has, as already noted, great significance. Not only man's body, but all objects, are pierced with pores or passages through which enter the effluences from objects. These pores vary greatly, and because in each of our sense organs the pores are capable of receiving only a particular sort of effluences, particles that are too large being kept out, while smaller ones pass through without touching, therefore each sense has its particular character and specialized work.[1] No differentiation is here provided between animate and inanimate things. This constitutes no objection to the theory, at least from Empedocles' point of view, though Theophrastus thought otherwise.

The symmetry of pores and effluences was very simply conceived. This is evident not only from all the notices that have come down to us, but from the general character of Empedocles' thought upon related problems. We may question Beare's suggestion of an analogy or relationship to Aristotle's subtle doctrine of the μεσότης or λόγος of each αἰσθητήριον by virtue of which it grasps the form without the matter of the thing perceived.[2]

It is characteristic of Empedocles' loose mode of thinking that the two bases of perception that have been mentioned, are not correlated. Symmetry of pores certainly cannot always imply that there are similar constituents, yet both condition sense perception. It is probable that both were thought of as forms of "likeness" and hence as substantially the same. Detailed analysis did not go far enough to reveal the fact that the two forms of likeness are essentially distinct, and therefore need definite correlation.[3]

SIGHT

Of the individual senses, sight proves the most interesting though by no means the simplest. The eye's structure is somewhat fully described in a fragment that has come down to us, and this account is supplemented by a passage of Theophrastus. We shall quote these passages. Empedocles, Fragment 84:

As when a man intending to make a journey gets ready a light, kindling a beam of blazing fire, a lantern to keep off all sorts of winds. It scatters the breath of

[1] Theophr., *De Sens.*, 7; Arist., *De Gen. et Corr.*, A 8, 324 *b*, 26. It is surely a mistake that this theory of sense perception is attributed to Parmenides, Aet., iv, 9, 6. Possibly Theophrastus' use of the word συμμετρία in another sense in discussing Parmenides' view of sense perception is responsible for the error. *De Sens.*, 1.

[2] Beare, p. 204, 1.

[3] The defect is noted by Theophrastus, though not in exactly the form in which we have stated it. The symmetry of pores, he says, practically superseded the other principle in the detailed working out of sense perception; *De Sensu*, 15. Plato reveals in many places the liability even in his own day to confusions of this sort.

the sweeping blasts, while the light, inasmuch as it is finer, leaps forth and gleams along the threshold with unwearied rays. Even so then, the primeval fire inclosed within the membranes, concealed in these thin coverings, lurked within the round pupil. The membranes are pierced throughout with passages divinely fashioned, which keep out the mass of water that lies around, while they let the fire through, inasmuch as it is finer.

Theophrastus tells us:

He says that within it [the eye] is fire, while inclosing it are earth and air, through which the fire passes like the light in lanterns inasmuch as it is fine. The pores of fire and water alternate, and by the pores of fire white things are perceived, by those of water, black things. . . . . The colors are brought to the sight by effluences.

Presumably the earth and air form the substance of the membranes spoken of in the fragment of Empedocles quoted above. It is hardly necessary to emend by adding water to earth and air, with Diels, or to interpret air as mist, with Burnet, in order to prepare for the pores of water to be mentioned. For water is clearly not correlated with earth and air in the structure of the eye, but it has an especial function. Theophrastus has perhaps taken its presence for granted because it seemed so obvious. Later in the passage ἀήρ should be interpreted not as mist but atmospheric air, which contains moisture.[1] The description is not in all points so clear as we could wish. It is surprising that we find fire and water set apart from the other two elements in the function of sight. The antithesis of light and dark alone seems to be taken account of, fire to perceive light things and water dark. By the Doxographers, to be sure, it is stated that four colors were recognized, corresponding to the four elements. But Theophrastus criticizes Empedocles for not taking account of other colors beside white and black, and ascribes the identical four here enumerated to Democritus.[3] It seems not unlikely, therefore, that the later tradition was at fault. If the analogy of the four colors to the four elements was drawn by Empedocles, it must have been a fancy left unrelated to the theory of vision as a whole. The employment of the simple antithesis of fire and water in the structure of the eye, strongly favors the view of Diels, that Empedocles was indebted to Alcmaeon for this part of his theory. We know that Alcmaeon also regarded the eye as made up of fire and water.[4]

[1] Theophrastus, 8 and 14; cf. *supra*, p. 32. [2] Aet., i, 15, 3.

[3] For the ascription of these colors to Democritus see 73 ff. For Theophrastus' criticism of Empedocles, see 17.

[4] Cf. Diels, *Emp. u. Gorg., loc. cit.*; Theophr., 26.
It is noteworthy that elsewhere the simple antithesis between heat and cold or,

Another puzzling factor in this description is the fact that fire is spoken of as passing out through the pores like the light in lanterns. How does this accord with the statement that effluences from objects enter the pores of the sense organ and are thus perceived? Zeller suggests, and in this he is followed by Gomperz and others, that the fire and the effluences from objects meet outside of the eye,[1] but there seems no adequate evidence for this position or sufficient reason for doubting Aristotle's implication that the two modes of vision were not related.[2] It is futile to attempt to supplement these accounts by conjecture. It is not impossible that the notion of fire as going out from the eye was carried no farther than the simple adoption of the analogy between the eye and a lantern. Just as the interior of the ear is like a bell, so the interior of the eye is like a lantern. Such an analogy between two things closely related, without careful discrimination how far the analogy extends, is quite in the manner of Empedocles. The power of a light when brought into a dark place, to reveal what before was invisible is a most astounding phenomenon, taken simply. The confusion between the function of light in revealing objects, and of sight beholding them is a most natural one.[3] Yet the analogy gives no hint of the process involved. Quite possibly Empedocles let the correlation of this notion with the theory of pores and effluences take care of itself. Against the attempts to harmonize the two doctrines, we have, in addition to Aristotle's statement, the implication of Theophrastus that the effluences entered the eye. It is not a little remarkable that Theophrastus' account gives no hint of the fact of fire passing out from the eye. This could hardly occur, had Empedocles developed that suggestion fully.[4] It is noteworthy, too, that Theophrastus and others in explaining Plato's theory of vision through fire emitted from the eye, never give any hint that he was anticipated by

heat and moisture is employed. Cf. Fr. 62, with the use of ἀμφοτέρων in l. 5. This is probably due to the dependence of Empedocles upon others in physiological matters. Arist., *Met.*, A 4, 985 *a*, 33 notes the tendency to employ the elements as two instead of as four.

[1] Zeller, p. 801. In his note Zeller refutes the theories which make the effluences meet inside of or on the surface of the eye.

Burnet, pp. 267, 268 mentions the two modes of vision without indicating this inconsistency.

[2] Arist., *De Sensu*, 2, 437 *b*, 23; Aet., iv, 13, 4, is a restatement of Aristotle.

[3] The active function of fire in many natural processes should here be recalled. Note especially its function in reflections, presently to be indicated.

[4] Theophrastus, to be sure, paraphrases the lantern passage, but without implying that the fire passes outward in the act of seeing. Beare, p. 20, fails to observe this fact and supposes Theophrastus' account to contain a contradiction.

Empedocles.[1] There is, indeed, no possible method of making effective use of this suggestion on the hypothesis that only like can perceive like, and in Fragment 109 vision in particular is said to be based on the principle of similarity.

Little interest or significance attaches to the further observations preserved to us regarding vision. Among them are the suggestion that gray eyes contain more fire, dark eyes more water,[2] that the former see better at night, the latter by day, because their deficiency is supplemented from the medium outside. An excess of either element causes the pores of the other to be smeared over, and occasions poor eyesight. The best eyes have a combination of both in equal proportions.[3] In reflections in mirrors the effluences collected on the surface of the mirror are driven back by the fire streaming out.[4] Transparent objects contain numerous pores but no adequate differentiation of them from other objects is made clear.[5]

HEARING

Empedocles' theory of hearing seems not yet to have been clearly understood, and the two accounts transmitted to us are meager and confused. These accounts are as follows. The text is that of Diels with his proposed corrections.

Theophr., 9: *τὴν δ' ἀκοὴν ἀπὸ τῶν ἔσωθεν γίνεσθαι ψόφων, ὅταν ὁ ἀὴρ ὑπὸ τῆς φωνῆς κινηθεὶς ἠχῇ ἐντός· ὥσπερ γὰρ εἶναι κώδωνα τῶν ἴσων ἦχων τὴν ἀκοήν, ἣν προσαγορεύει σάρκινον ὄζον· κινουμένην δὲ παίειν τὸν ἀέρα πρὸς τὰ στερεὰ καὶ ποιεῖν ἦχον.*

This passage is translated by Beare:

Empedocles says that hearing results from the sounds coming from without,[6] whenever the air, being set in motion by the voice, rings within [the ear]. For the organ of hearing, which he terms "the fleshy bone," is a sort of gong which rings internally. The air when it is set moving, beats against the solid parts, and thus causes the ringing sound.

Aet., iv, 16, 1: *Ἐ. τὴν ἀκοὴν γίνεσθαι κατὰ πρόσπτωσιν πνεύματος τῷ χονδρώδει, ὅπερ φησὶν ἐξηρτῆσθαι ἐντὸς τοῦ ὠτὸς κώδωνος δίκην αἰωρούμενον καὶ τυπτόμενον.*

[1] A close approximation to Plato's view is ascribed to Hipparchus, by some to the Pythagoreans and to Parmenides, but not to Empedocles. Aet., iv, 13, 9, 10.

[2] Arist., *De Gen. An.*, E 1, 779 *b*, 15.

[3] Theophr., 8. [4] Aet., iv, 14, 1.

[5] Arist., *De Gen. et Corr.*, A 8, 324 *b*, 29.

[6] Beare follows here the first edition of *Vorsokratiker*, which kept the MSS *ἔξωθεν*. Diels now accepts Karsten's emendation *ἔσωθεν*.

Beare's translation is as follows:

Empedocles teaches that hearing is caused by the impact of the air-wave against the cartilage which is suspended within the ear, oscillating, as it is struck, like a gong.

In the first passage one or two points need consideration. In the first line the manuscripts provide no subject for ἠχῇ. Diels, probably rightly, supplies ὁ ἀήρ. Instead of κινηθείς we find in the manuscripts κινηθέν, which can hardly be satisfactorily construed. Diels had formerly suggested κινηθῇ (*Dox.*, 501, 13). The reading ἴσων, later, is questioned by Diels, but gives about as good sense Diels's abandoned conjecture ἴσωθεν, which Beare follows. Translate "echoes that resemble the sounds outside."[1] Further, we may interpret κινουμένην "when this organ of hearing [the bell] is set in motion, it causes the air to beat against the solid parts of the ear and produces an echo." Finally, if we retain the manuscript reading for Empedocles' characterization of this bell, we shall interpret it "fleshy growth," which is surely as appropriate as "fleshy bone," an interpretation wherein again Beare follows an abandoned conjecture of Diels. Taken in strictness the passage states the organ of hearing, τὴν ἀκοήν, this fleshy growth, and the bell, to be one and the same. In the Doxographic passage χονδρώδει may be a later blundering attempt to define this fleshy growth. Theophrastus' account is certainly the more trustworthy one and it contains nothing else that could be so defined. Possibly the tympanic membrane itself is meant, which transmits the sound from the outer air to the air of the inner ear, causing an echo there.[2] The walls of the tympanic cavity are chiefly of bone, and they may be the solid parts, τὰ στερεά, of Theophrastus' description. These solid parts cannot be the bell itself, and hence the passage cannot, on any hypothesis, be reconciled with the Doxographic description. This need not surprise us, the Doxographic accounts being so condensed and in subjects like this so often missing the point of the theory involved.

If the tympanic membrane was observed by Empedocles, its comparison to a bell is just as appropriate as its later comparison to a drum. By a bell we should understand a gong struck from the outside, not a bell with a clapper. Zeller's insistence that a trumpet is meant has no support and is admittedly contrary to Theophrastus' evidence.[3]

[1] Beare, 96, 1, suggests that there may be in ἴσων the implication that "there are sounds that we cannot hear, as there are colors that we cannot see, though other creatures may see and hear them." This seems, however, very doubtful.

[2] Cf. Philop., *De An.*, p. 355, 17, which gives some help to the understanding of the thought here suggested.

[3] Theophr., *De Sensu*, 21.

The theory of Empedocles is very close to that of Alcmaeon, a fact that is not surprising in view of the indebtedness we have seen reason to assume in other portions of Empedocles' system.

The naivete of the notion that hearing is explained if once we have the external sounds repeated within the ear is remarked by Theophrastus.[1] It is, however, a mode of reasoning very persistent in its hold upon the human mind.

On any interpretation of these passages, the doctrine of effluences and pores has incomplete application, yet the divergence in principle is not so great from Empedocles' standpoint. The sound moving toward the ear represents the effluence. The principle that like perceives like is met nearly enough for his purposes, we may believe, by regarding the act of hearing as an echo or repetition of the sound. This is not exact thinking but it is not more inexact than we should expect.

SMELL

Smell seems to be, of all the senses, the one to which the doctrine of pores and effluences most readily applies. Not that the psychological problems involved are explained. That we have ceased to expect. But odor is obviously an effluence which passes through the air to the inner surface of the nostrils. The power of dogs to follow a trail by means of odors imperceptible to man, is evidence that effluences are more universal than we are at first inclined to suppose. Fragment 101 reads: "Tracking with their nostrils the minute particles from the bodies of animals (and the odors) which are shed from the feet upon the tender grass." The close connection of smell with breathing is observed, and the fact that labored breathing or catarrhal troubles affect the sense of smell. Those animals that breath the most vigorously have the keenest sense of smell. Most odors, it is thought, come from bodies that are fine and light in weight.[2]

TOUCH AND TASTE

Theophrastus tells us that no special account was given by Empedocles of the sense of touch and taste.[3] This was perhaps because, roughly speaking, their nature from this point of view is obvious. Certainly in the case of taste, the function of the pores is clear, though it might be questioned whether the particles which enter them would in strictness be called effluences.

[1] *Ibid.*, 25; Aet., iv, 16, 2.

[2] Theophr., 9. Cf. the criticism, § 19. See also Fr. 102; Aet., iv, 17, 2.

[3] Secs. 9 and 20.

Regarding flavors a few hints have come down to us, but they seem to have found place in the description of the growth of plants with their variously flavored fruits, and perhaps of animals, and not in connection with the theories of sense perception.[1]

OTHER PSYCHOLOGICAL OBSERVATIONS

Likeness is the basis of pleasure, unlikeness of pain.[2] This accords well with the tendency to regard likeness as a basis of attraction, but is not strictly consistent with the view that like perceives like, for pain surely involves perception. This difficulty, however, need not have been remarked.

Fragment 107, on one interpretation, ascribed feelings of pleasure and pain to all things. This interpretation is not necessary, yet the idea would not surprise us when intelligence has been declared to be universal.[3]

Unsatisfactory as is the understanding we have reached of the details of perception as explained by Empedocles, our survey is sufficient to make clear what is after all more important than the missing data, namely that the processes of sense perception are beginning to occupy the minds of Greek thinkers very seriously. The problems raised are physical and physiological primarily, not psychological. The only really important exception recorded, is an observation borrowed from Parmenides to the effect that thought changes with bodily structure.[4] Gomperz perhaps gives Empedocles too much credit in characterizing him as the one who led the way to the recognition of the subjective factor in sense perception and its relativity to the individual.

[1] Water is said to contain all sorts of flavors, which are usually imperceptible because the particles are so small. The significance of this remark in relation to the growth of plants is apparent, Arist., *De Sensu*, 4, 441 *a*, 3. We may perhaps associate with this the remark that wine is water which has undergone a process of putrefaction inside the bark, Fr. 81, and that the sea contains sweet water as well as bitter. Aelian, *Hist. An.*, ix, 64.

[2] Theophr., 9, which seems to mean that the similarity is in the elements constituting the part of the body which feels pleasure or pain; cf. Theophr., 16; Aet., v, 28, 1. The text of the latter passage is hopelessly confused. We g. in from it the additional notice that desire springs from the lack of the material elements needed by the animal that feels desire. *κατὰ τὰς ἐλλείψεις τῶν ἀποτελούντων ἕκαστον στοιχείων.* Cf. also Aet., iv, 9, 14, and 15.

[3] We know from Caelius Aurel., *Morb. Chron.*, i, 5, that the subject of insanity received some consideration, but we are unable to gain any satisfactory notion from this brief mention.

[4] Fr. 106 and 108; Parmenides, Fr. 16.

THE *PURIFICATIONS*

The contrast in temper between the *Physics* and the *Purifications* has given rise to many theories about the relation of the two works. This contrast is due partly to the difference in theme, but it extends to irreconcilable contradictions on certain points. Bidez and Diels have felt these contradictions so keenly that both conceive it impossible that the two works could have been written in the same period of the poet's life. The opposing views put forth by the two men have been noticed in another connection, but may again be briefly stated. Bidez has imaginatively constructed a romantic biography of the poet, picturing him in youth, at the time of his brilliant political career, composing the *Purifications*, in the preface of which he addresses the people of Akragas with such lofty pride, resting so confidently upon his divine claims and exalted powers. Late in life, in banishment, deserted by friends and deprived of influence, he addresses in his loneliness the *Physics* to his only friend Pausanias. The tempered rationalism and scientific acumen of this work, contrasting strikingly with the religious enthusiasm and even extravagance of the *Purifications*, reveals the sobering influence of adversity, and of years of lonely study and reflection upon nature.

Diels, sharing to the full Bidez' conviction of the fundamental contrast between the two works, finds incredible the psychological development outlined by Bidez.[1] Both writers are unable to discover any conclusive evidence on the point other than psychological probability.[2] History fails to give us, Diels believes, an instance of a man in his youth playing the part of a religious wonder-worker and magician, in his old age developing into a scientific scholar of so skeptical and empirical a temper.

Both these discussions attempt too extensive a reconstruction on a slight basis of fact. Either line of psychical development is conceivable, and there is little doubt that historical parallels for either could be found. But neither one seems necessitated by the facts. The contrast in temper between the two works, considerable as it is, is by no means great enough to prove that a long interval of time must have elapsed between their composition. Extravagant claims are not absent from the *Physics*. Fragment 111 certainly claims much when it promises power to stop adverse winds

[1] Diels, *Sitz. d. Berl. Ak.*, 1898, 396 ff.

[2] Diels argument, that the use of Νεῖκος conventionally in the *Purifications* is indication of the later date for that work, is not without force. Cf. Fr. 115, 14.

and drought, to avert old age, and even "to bring back from Hades a man's might." Diels makes the astonishing claim that no more is promised here than is perfectly consistent with a scientific conservatism, "nicht mehr als das, was auch heutzutage die Wissenschaft ihren Adepten verspricht; die Gesetze der Natur mitzutheilen um dadurch sich zu ihren Herrn zu machen." The promise of power to waken the dead, he interprets as referring merely to apparent death. If one can accept this reasoning, he will find in Diels's position no insuperable difficulties.[1]

The placing of the fragments describing the deity[2] in the *Purifications* instead of the *Physics*, where they have hitherto been found, is obviously an integral part of Diels's argument, having as its motive the presenting of a purer contrast between the two works. The testimony of Tzetzes that they belong to the third book of the *Physics*, has not, to be sure, overwhelming weight, and Diels may be right in making the change. Yet the case is not proven by the fact that the physical system of the first two books has no place for such a theology.[3] Fragment 131, moreover, seems out of place in its present position. The change of subject is here not so marked as the tone of the passage implies.

Burnet and Rohde have gone nearly as far in attempting to reconcile the religious and physical doctrines of Empedocles, as Bidez and Diels in contrasting them. Burnet follows Hippolytus in identifying the god who is only a "sacred intelligence" with the Sphaeros.[4] Rohde recognizes more adequately than he the contrast in temper between the two works, but he also finds place for this doctrine in the physical system.[5] The supreme divinity is a part of the Sphaeros when Love is in control, but when the Sphaeros is dissolved he exists independently, or rather is divided by Strife into individual daemons who are exiles and fugitives from the godhead.

Burnet's position is clearly irreconcilable with the description of this deity in the last two lines of Fragment 134, though the similarity of the first three lines to the characterization of the Sphaeros in the *Physics* makes it

[1] A further bond of connection in temper between the *Physics* and the *Purifications* may be seen in the exordium to the former work. Regarding the truth as holy, and not to be revealed to mortals beyond a certain point is distinctly in the spirit of the religious mystic.

[2] Fr. 131 to 134.

[3] Human thought, in a period not yet fully conscious of the antithesis of matter and spirit, could admit such a contradiction where a later age could not. Cf. p. 80.

[4] Hipp., *Ref.*, vii, 29; Fr. 134.

[5] Rohde, p. 480, n. 1.

tempting. Rohde's position is ingenious, but not supported by sufficient evidence to make it acceptable.[1]

Another religious doctrine of Empedocles which is difficult to bring into accord with the *Physics* is the theory of transmigration of souls. Rohde's view here is worked out with even more acumen and pains, and is rooted in ancient religious tradition. The thinking powers which Empedocles identifies with the blood, are a part of the physical soul, which dies with the body. The immortal soul is the soul-daemon of Homer, which leaves the body and passes successively through the various phases of mortal existence. It is now a fish, now a man, now a bush, now a god. This soul-daemon, as already suggested, is a part of the divine intelligence, an intelligence that is divided by Strife into many individuals. Ultimately it will return after purification to its source. When the Sphere recurs, all these soul-daemons will once more become one with their divine origin.[2] This hypothesis furnishes the best basis that has been proposed for reconciling the contradictions noted, and has won the unqualified assent of Gomperz; yet decisive evidence is lacking. The analogy drawn with the "soul-daemons" of Homer and others is a happy one, but the relation assumed between these individual "daemons" and the universal intelligence, as well as the Sphaeros, seems highly improbable.

Burnet interprets this doctrine as he does the divinity of the *Purifications*, materialistically, and thus removes its contradiction with the *Physics*. All Empedocles needs, Burnet says, "would be amply provided for by the reappearance of the same corporeal elements in different combinations."[3] Fragment 15 of the *Physics* fits in well with this interpretation, yet it does not necessarily imply the survival of personal identity, and it is not easy to see how any means of preserving it could be provided on this basis. Burnet seems to overlook the real problems involved, but his view furnishes a possible alternative to that of Rohde.

The exact degree of discrepancy between the two works of Empedocles will probably never be known. The data are not at hand for a sufficiently complete reconstruction of the thought of either poem. In any case the inconsistencies are not psychologically surprising, however great be the irritation they occasion in logical minds. It is common enough at all times

[1] Zeller, p. 806, recognizes the impossibility of fully reconciling the two works.

[2] We may note that the doctrine of recollection, ἀνάμνησις, is ascribed to Empedocles in this connection, but without adequate ground.

Against Rohde's supposition that it is the soul-daemon which has the philosopher's "Tiefblick," Frag. 110 is conclusive. The passage has to do with our cultivation of philosophical thoughts, yet the phraseology at the end is materialistic.

[3] Burnet, p. 271.

to find religious and scientific interests which are mutually exclusive, persisting side by side, and not infrequently both of them finding literary expression. In Empedocles' time the demand for logical unity and consistency was doubtless less insistent than later. Certainly no one can fail to recognize in him individually a temper less logical than in other thinkers of his own time, notably Parmenides and Anaxagoras; and even in Parmenides we find the "way of opinion" side by side with the "way of truth."

Not only is it hopeless to attempt to ascertain the precise degree of inconsistency between the *Purifications* and the *Physics*, but it is equally useless to search for the exact temper in which the *Purifications* was written. Certain obvious things may be said of it. Its motive in the main is not philosophical nor scientific. It is evidently much more closely bound up than is the *Physics* with its author's career as wonder-worker and religious reformer, and is intended to further the brilliant success referred to in the opening lines, where he describes himself as a god, receiving acclaim and divine honors from throngs of men and women. To what extent did the author of these lines care whether he was consistent or not? Did he cast aside a work previously written as inadequate, in the light of the more dazzling truth he now beheld? Did he adopt the religious ideas of the Orphic cult without fully believing them, because of their efficacy with the multitude? If he did so adopt them, was his motive a desire to benefit his fellow-men, or to further his own popularity and ascendency over their minds? Probably none of these questions will ever be answered. They have been framed in this connection simply to suggest the degree of our ignorance. It is difficult enough to judge the work of a man in whom some elements of the charlatan are present, when we possess his works. It is clearly impossible to base on a few scattered fragments and notices a stable reconstruction.

It is interesting to notice the points of contact with Pythagoreanism, not only in the doctrine already mentioned, the transmigration of souls, but in the practical prescriptions enjoined, such as the refraining from the eating of meat, a natural deduction from the doctrine of transmigration. At this point the disregard for logical consistency is strikingly apparent. The reasons that make the sacrificing and eating of animals a sin, would be quite as cogent against the eating of any living thing, or if we take into our reckoning the teaching of the *Physics*, of anything whatsoever. This prescription as well as the refraining from the use of beans, and from the laurel, evidently has to do with the attempt to escape the curse that attends our birth. We seem to be in a distinctly more religious atmosphere than that attending the

similar prescriptions of Pythagoras,[1] the dominant suggestion being, not preparation for philosophical pursuits, but ritualistic purification. This fact confirms the conclusion elsewhere reached, that he was perhaps more indebted to the Orphic cult than to the Pythagoreans. How far the points of contact are ideas and observances taken by both from the Orphics, we can hardly hope at present to learn. If the spiritualistic deity of Fragments 133 and 134 be really the Apollo of the Orphics, which now seems very likely,[2] we can more readily understand its inconsistency with the body of Empedocles' thought than if both were independent conclusions.[3]

It is strange that this view of the deity was so long regarded as an adaptation of Xenophanes' teaching. The polemic against anthropomorphism may well be borrowed, but the deity of Xenophanes is distinctly pantheistic, while the "sacred mind that flashes through the whole universe with swift thoughts" is not necessarily even monotheistic.

The lot of the soul that has sinned, is a dismal and unhappy one. It must wander in consequence of sin for thrice ten thousand seasons, cast from one element to another, from one incarnation to another, without finding peace.[4] This earth seems now the special abode of sorrow. The words in which are described the poet's own sufferings and laments upon entering upon this life, have profoundly impressed many readers.[5] In the distant past was a time when life was better than now, when men worshiped, not the present gods, but Kypris, and when her kindly spirit everywhere prevailed.[6] Those who follow the religious practices enjoined will advance by successive incarnations in the scale of being, till they reach the life of the gods.[7] This last suggestion is in sympathy with the tendency of the *Physics* to break down the gap separating the different kinds of existences. The process is continuous downward as well as upward, for the soul passes through various plant and animal forms.[8]

In its wanderings outside of this life, the spirit seems to have had a part in ordering affairs upon the earth.[9]

[1] Perhaps we should say in an atmosphere more exclusively religious, for Pythagoras' thought has also its important religious elements.

[2] Cf. Diels, *Sits.*, 1898, pp. 403 ff.

[3] Ammonius, *De Interp.*, 249, 1, asserts this deity to be the Apollo of the Orphics.

[4] Fr. 115.

[5] Fr. 118; 119; 120; 121; 124.

[6] Fr. 128 and 130.

[7] Fr. 146; cf. Aet., i, 7, 28.

[8] D. L., viii, 77; Emp., Fr. 117; Hipp., *Ref.*, i, 3 (*Vors.*, 31). Plato's *Phaedrus* 248 C, contains points in common with this account. Whether he received them from Empedocles or from Orphic tradition in some other form, is uncertain.

[9] Hipp., *loc. cit.*

The spirit of the *Purifications* is strongly ethical throughout, although emphasis is laid upon ceremonial purification. The poet's temper is, indeed, so distinctly ethical that ideas with this color are introduced in the *Physics* where we should least expect it.[1] One of the most striking passages of the *Purifications*, Fragment 135, asserts the law of justice to be universal and spread throughout the heavens. The thought is a remarkable one for this period.

There are obvious points of contact between the doctrines thus outlined and the *Physics*. The four elements are enumerated in familiar phraseology when the soul's wanderings are described.[2] The golden age suggests the time when Strife had not gained so great ascendency as now; men worshiped Aphrodite alone.[3] Strife under his familiar name Νεῖκος is responsible for the poet's fall from the realm of the gods. The description of the divine spirit in part duplicates the phraseology used of the Sphaeros and of Love.[4] Finally, we may note the breaking down of the chasm between man and the lower orders of existence, a teaching that is fundamental in both.

On the whole the coincidences are quite as numerous and important as the discrepancies, but cannot lead us to forget the great differences of temper and purpose in the two works.

[1] The very names Love and Strife strikingly exemplify this. Strife is always baneful in his operation, though all individual existences are conditioned upon his activity.

[2] Fr. 115.

[3] Fr. 128.

[4] Cf. Fr. 133 and 134, with 29 and 17, 21.

ANCIENT PHILOSOPHY

1. Otto Apelt. *Platonis Sophista. Recensuit, Prolegomenis et Commentariis Instruxit*
2. Grace Hadley Billings. *The Art of Transition in Plato*
3. Thomas H. Billings. *The Platonism of Philo Judaeus*
4. Ingram Bywater. *Aristotle on the Art of Poetry. A Revised Text with Critical Introduction and Commentary.*
5. Lewis Campbell. *The Theaetetus of Plato. A Revised Text and English Notes.* Second Edition
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